SALDA

AHU WITH HEAT RECOVERY

Smarty 3X VER

User‘s and service technical manual

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Symbols

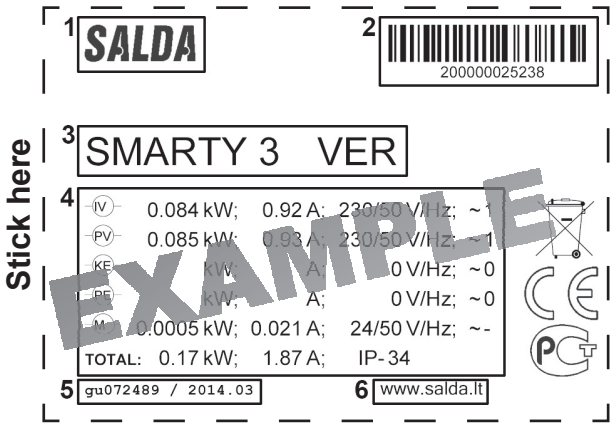
Warning – pay attention

Additional information

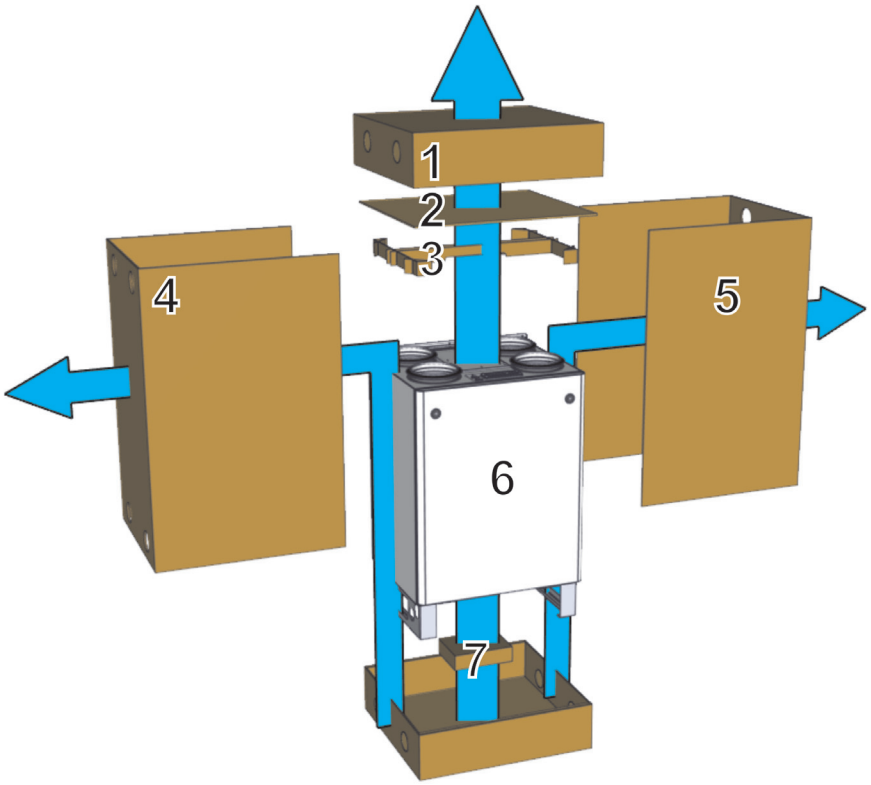
Marking

Stick the auxiliary label on the unit (on an easily accessible place) or on the dashed place of a technical manual in order to keep the important information about the unit.

1 – Logo
2 – Internal usage code
3 – Brand name
4 – Technical data
5 – Units number
6 – Web address



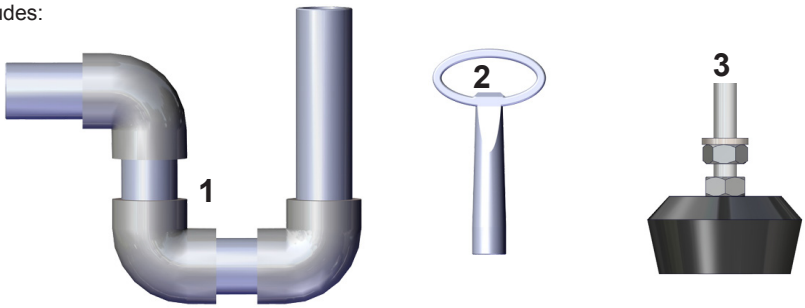
Unpacking



Standard package of components

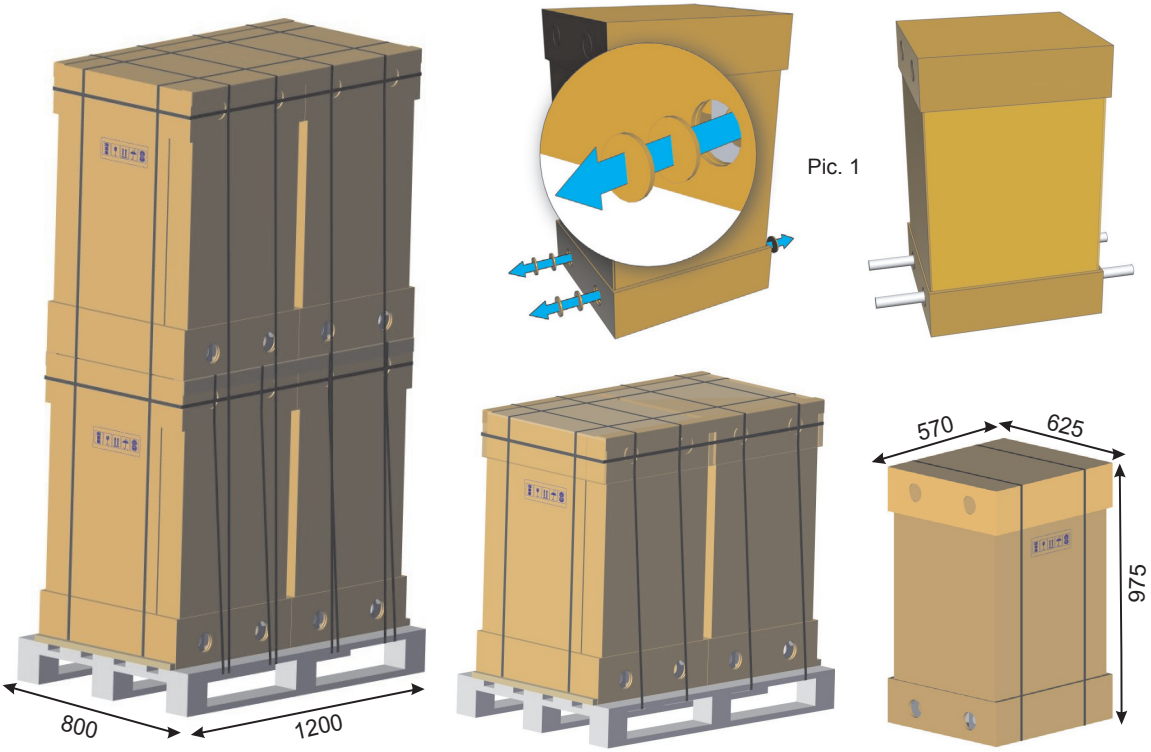
Standard package (without optional accessories) includes:

1. 1. Siphon – 1 pcs;
2. 2. Key – 1pcs;
3. 3. Anti-vibration mounts – 4 pcs.



Transportation and storage

• All units are packed in the factory to withstand regular conditions of transportation.
• The unit can be lifted using metal rods (Pic. 1). Rod diameter - 35-40mm.
• Upon unpacking, check the unit for any damages caused during transportation. It is forbidden to install damaged units!!!
• The package is only for protection purpose!
• While unloading and storing the units, use suitable lifting equipment to avoid damages and injuries. Do not lift units by holding on power supply cables, connection boxes, air extract or exhaust flanges. Avoid hits and shock overloads. Before installation units must be stored in a dry room with the relative air humidity not exceeding 70% (at +20°C)
and with the average ambient temperature ranging between +5°C and +30°C. The place of storage must be protected against dirt and water.
• The units must be transported to the storage or installation site using forklifts.
• • The storage is not recommended for a period longer than one year. In case of storage longer than one year, before the installation it is necessary to verify whether the bearings of fans and motor rotate easily (turn the impeller by hand) and if the electric circuit insulation is not damaged or the moisture is accumulated.



Pic. 1

Preparation for transportation

Description

Air handling unit SMARTY 3X VER with plate heat exchanger (temperature efficiency up to 90 %) is designed to clean and supply fresh air. The unit takes heat from exhausted air and transmits it to supply air.

MAIN FEATURES
Air flow ranges:

• Building protection	60 m³/h;
• Minimal	95 m³/h;
• Nominal	233 m³/h
• Maximal	333 m³/h

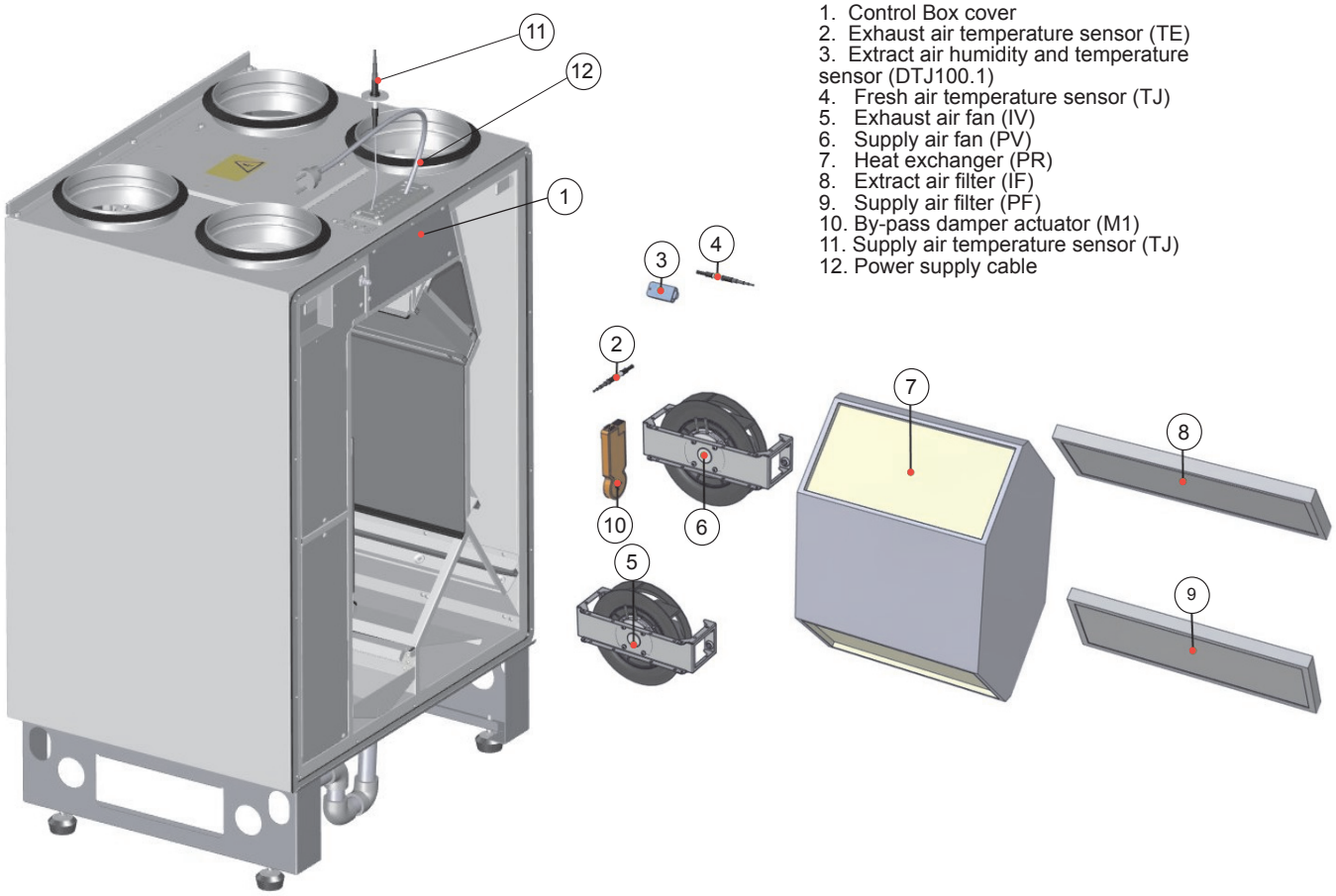
• Counter flow heat exchanger is made from aluminum and has the following dimensions: (WxHxD) 271 x 496 x 350 mm. Spacing between the plates is 4 mm;
• Efficient and silent EC fans - type R3G190RC05-03 Sound Power Level LW 45 dB(A) (ISO 9614-2 or ISO3744);
• Low SFP (Specific Fan Power) level: ≤ 0.35 W/(h/m³);
• Housing is made of galvanized steel. Outer side of the housing - white powder coating - RAL 9016. Inner corners of the body separating the air flows are sealed with a sealant material.
• 30mm acoustic and thermal mineral wool insulation of external walls; to maintain low leakage level the doors are covered by special sealing material from foam.
• Integrated control automation, Plug & Play function;
• SMARTY 3X VER can be controlled with FLEX or Stouch control panels;
• Filter type corresponds to the requirements of LST EN 779:2013:
Extract – panel M5 (WxHxD) 435 x 175 x 25 mm
Supply – panel F7 (WxHxD) 435 x 175 x 25 mm
• Outdoor exploitation temperature +5°C to +40°C.

Not suitable for swimming pools, saunas and other similar facilities.

Safety precautions

- Do not use the unit for purposes other than its' intended.
- Do not disassemble or modify the unit in any way which may lead to mechanical failure or injury.
- Use special clothing and be careful while performing maintenance and repair jobs – the unit's and its components' edges may be sharp and cutting.
- Do not wear loose clothing that could be entangled in to operating unit.
- Do not place fingers or other foreign objects through inlet or exhaust guards or into connected duct. If a foreign object enters the unit, immediately disconnect power source. Before removing object, make sure that any mechanical motion has stopped, the heater has cooled down and the restart is not possible.
- Do not connect to any other power source than indicated on the model label.
- Do not place or operate unit on unsteady surfaces and mounting frames.
- Mount the unit firmly to ensure safe operating.
- Never use this unit in any explosive or aggressive elements containing environment.
- Do not use the unit if external connections are broken or damaged. If there are any defects, stop operating the unit and replace the damaged parts immediately. That can be performed only by qualified electrician.
- Do not use water or another liquid to clean electrical parts or connections.
- If you notice water on electrical parts or connections, stop operating the unit.

Components



1. Control Box cover
2. Exhaust air temperature sensor (TE)
3. Extract air humidity and temperature sensor (DTJ100.1)
4. Fresh air temperature sensor (TJ)
5. Exhaust air fan (IV)
6. Supply air fan (PV)
7. Heat exchanger (PR)
8. Extract air filter (IF)
9. Supply air filter (PF)
10. By-pass damper actuator (M1)
11. Supply air temperature sensor (TJ)
12. Power supply cable

Operating conditions

- Unit is designed to operate only indoors.
- It is forbidden to use the unit in potentially explosive environment.
- Unit is designed to supply/extract only clean air (free of chemical compounds causing metal corrosion, of substances aggressive to zinc, plastic and rubber, and of particles of solid, adhesive and fi bred materials).

Supply	- temperature min./max.*	[°C]	-15 / +40
	- humidity	[%]	90

Extract	- temperature min./max.	[°C]	+15 / +40
	- max. humidity	[%]	70

***With additional pre-heater**

Maintenance

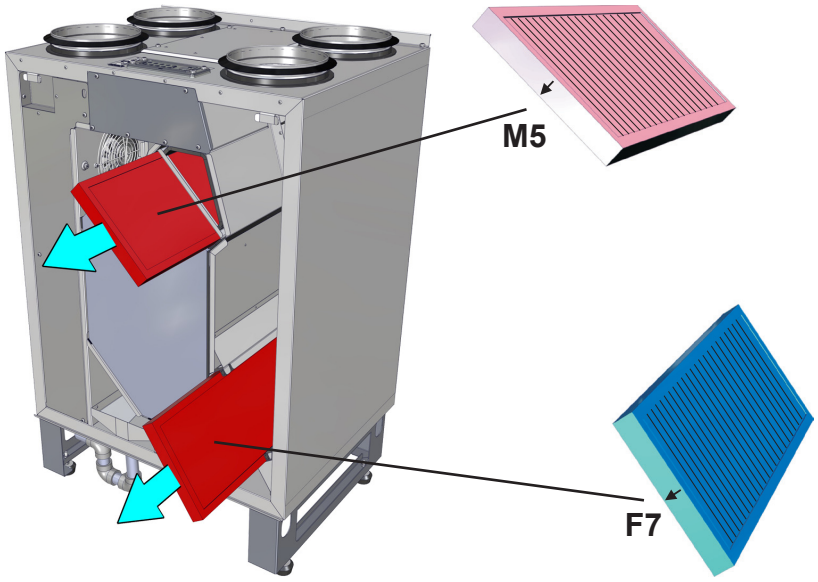
Unplug unit from mains before opening the door (disconnect the power plug from the outlet or if there is a two-pole automatic circuit breaker installed – disconnect it as well. It is necessary to ensure that it won't be turned on by third parties) and wait until the full stop of the fans (for about 2 min.).

Filtrų

Dirt increases air resistance in the filter, therefore less air is supplied into the premises.

It is recommended to change the filters every 3-4 months, or in accordance to filter timer.

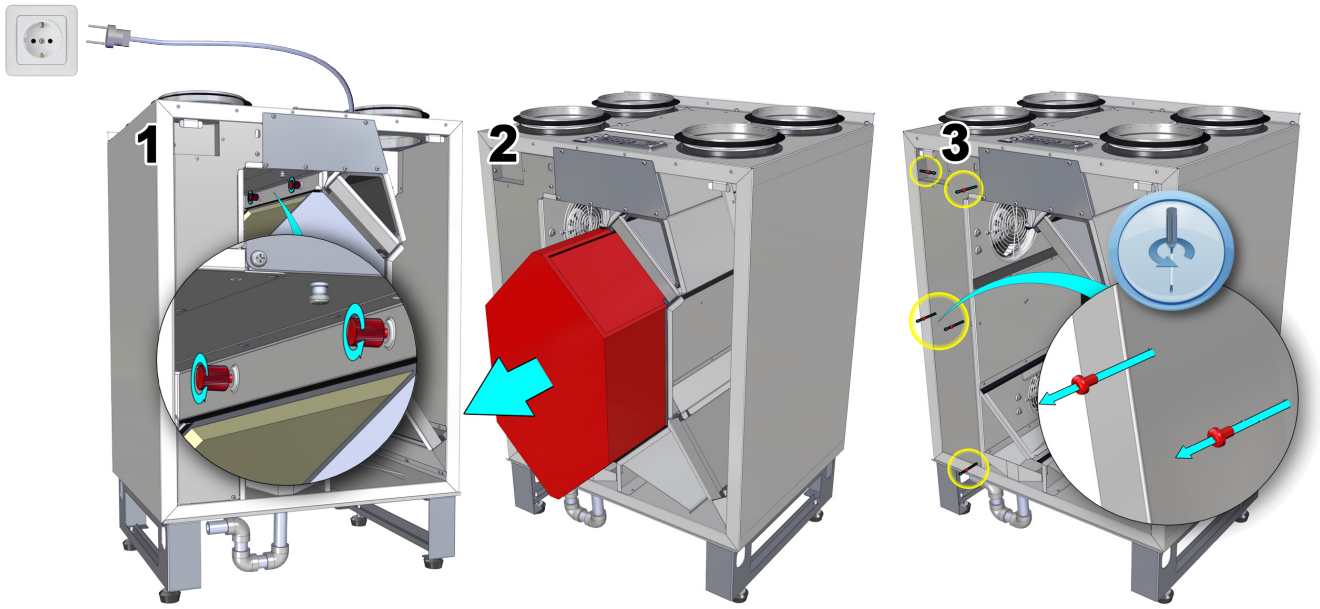
After changing the filters reset the filter timer on the control panel. How to that is described in 14 paragraph.

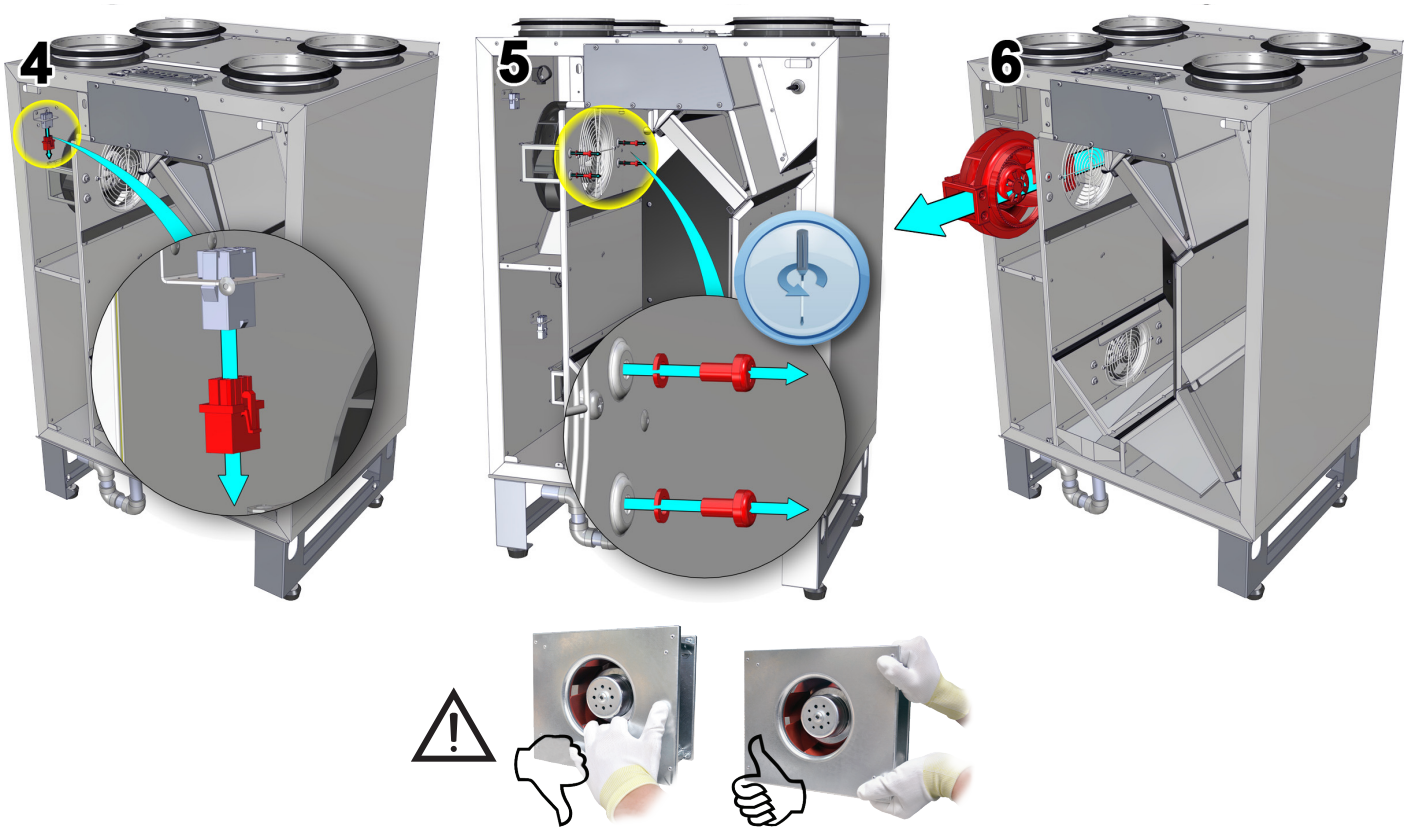


Fan

- Maintenance should be performed only by experienced and trained staff.
- The fan should be inspected and cleaned at least once a year.
- Be sure the fan is disconnected from power source before performing any maintenance or repair.
- Proceed to maintenance and repair after any rotation in the fan is stopped.
- Observe staff safety regulations during maintenance and repair.
- The motor is of heavy duty ball bearing construction. The motor is completely sealed and requires no lubrication for the life of the motor.
- Detach fan from the unit.
- Impeller should be specially checked for buil-up material or dirt which may cause an imbalance. Excessive imbalance can lead to accelerated wear on motor bearings and vibration.
- Clean impeller and inside housing with mild detergent, water and damp, soft cloth.
- Do not use high pressure cleaner, abrasives, sharp instruments or caustic solvents that may scratch or damage housing and impeller.
- Do not plunge the motor into any fluid while cleaning impeller.
- Make sure, that impeller's balance weights are not moved.
- Make sure the impeller is not hindered.
- Mount the fan back into the unit. Connect the fan to power supply source.
- If after maintenance the fan does not start or stop itself, contact the producer. Malfunction of the fan can be identified according to the pressure in the system (when pressure switches are connected). When there is a folt in fans' motor, any separate notice is shown on the control panel.

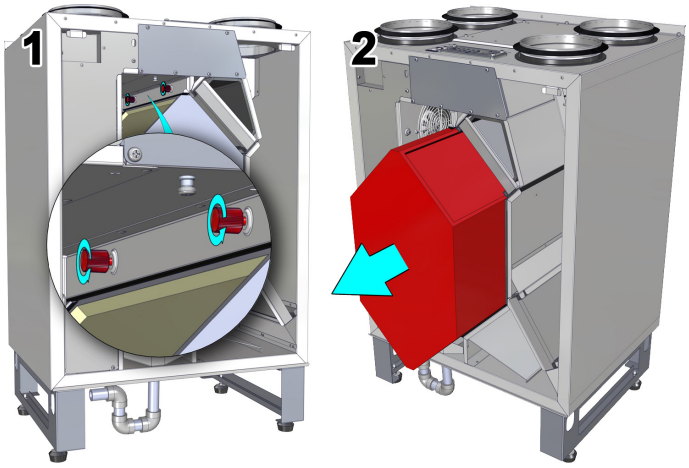
Be sure the unit is disconnected from power source before performing any maintenance or repair.





Heat exchanger

- Proceed to maintenance and repair after any rotation in the fan stopped.
- Clean the heat exchanger once a year.
- Firstly take out heat exchanger cassette carefully. Submerge it into a bath and wash with warm soapy water (do not use soda). Then rinse it with weak hot water stream (too strong stream can fold the plates). Place back the heat exchanger only when it is completely dry.



Warranty

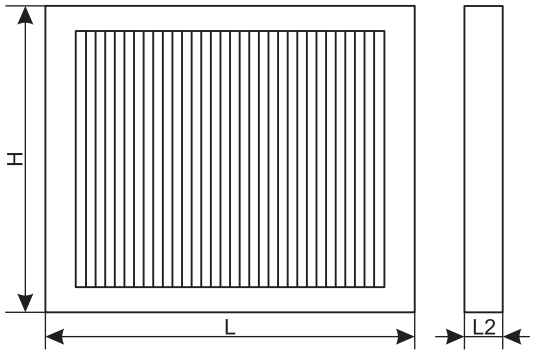
1. All equipment manufactured in our factory is pre-run and tested before leaving. Test protocol is supplied together with the unit. The equipment is shipped in good working order and condition to the direct client. The unit is warrantied for the period of two years from the invoice date.
2. If equipment is found to have been damaged in transit, a claim should be made against carrier, as we assume no responsibility for such damage.
3. This warranty does not apply:
3.1. when transportation, storage, installation and maintenance instructions of the unit are violated;
3.2. when the equipment is improperly maintained - inadequate maintenance;
3.3. when the equipment without our knowledge and permission has been upgraded or unskilled repairs were made;
3.4. when the unit was used not for its original purpose.
4. This warranty does not apply at these malfunction cases:
4.1. mechanical damage;
4.2. damage caused by entering foreign objects, materials, liquids;
4.3. damage caused by natural disaster, accident (voltage change in the electricity network, lightning, etc..) or accident.
5. The company assumes no liability for its products either directly or indirectly damage, if the damage is caused by failure to comply with installation and mounting regulations, deliberate or careless users or third-party behavior.

These conditions are readily discernable when the equipment is returned to our factory for inspection.
If the direct client determines that equipment is found to be faulty, or a breakdown occurred, he should inform the manufacturer within five working days and deliver the equipment to manufacturer. Delivery costs should be covered by customer.

Technical data				
Fans		- phase/voltage	[50 Hz/VAC]	~1, 230
	exhaust	- power/current	[kW/A]	0,086 / 0,92
		- speed	[min^{-1}]	3200
	supply	- power/current	[kW/A]	0,089 / 0,93
		- speed	[min^{-1}]	3200
		- control input	[VDC]	0-10
		- protection class		IP-54
Total power consumption		- power/current	[kW/A]	0,17 / 1,85
Automatic control integrated				+
Thermal efficiency				90%
Insulation of walls			[mm]	30
Netto weight			[kg]	57
Max unit's power/current (with all possible accessories			[kW/A]	1,47 / 7,52

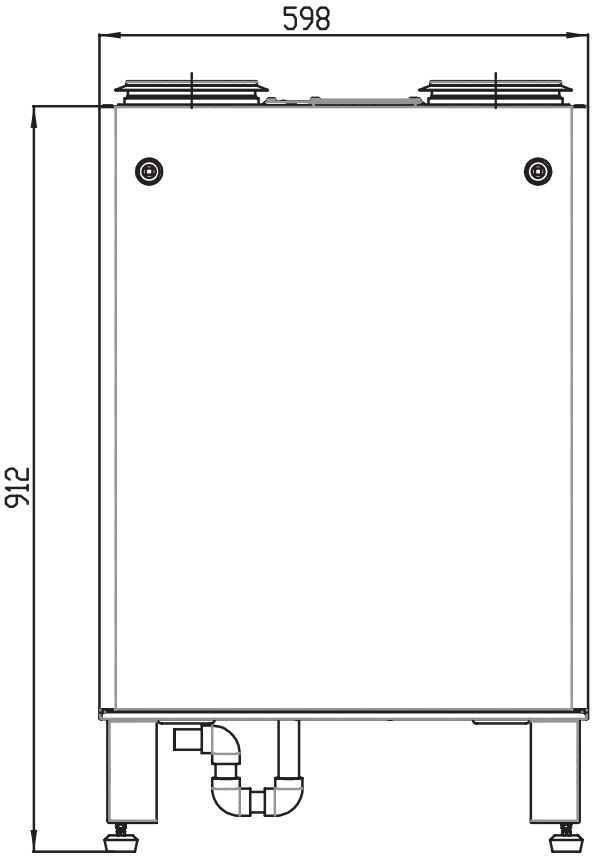
Accessories EKA and EKA NIS electro technical data					
Accessory	Heater	EKA	- phase/voltage	[50 Hz/VAC]	~1, 230
			- power/current	[kW/A]	0,3 / 1,3
			- control input		ON/OFF
	Pre-heater	EKA NIS	- phase/voltage		~1, 230
			-power/current	[kW/A]	1 ,0 / 4,3
			- control input		0-10 V

Filters			
Filter class and dimensions	Exhaust		M5
	Width	L [mm]	435
	Height	H [mm]	175
	Depth	L2 [mm]	25
	Supply		F7
	Width	L [mm]	435
	Height	H [mm]	175
	Depth	L2 [mm]	25
	Filter model		MPL



Subject to technical modification

Dimensions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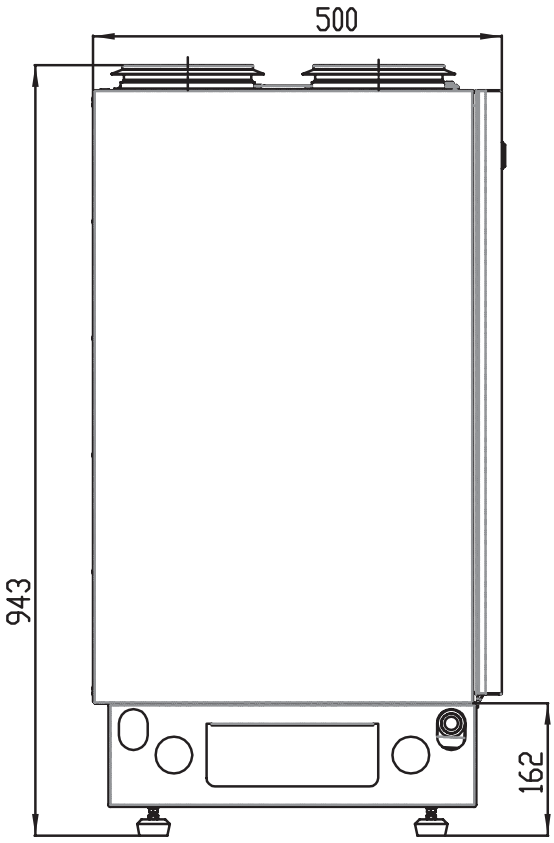
912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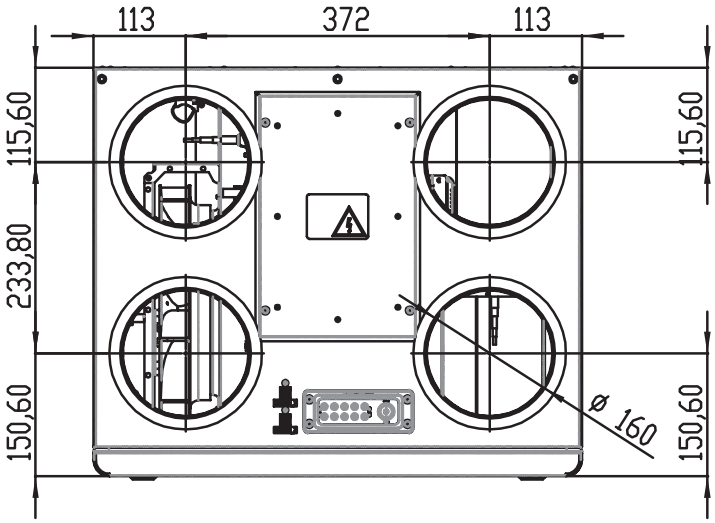
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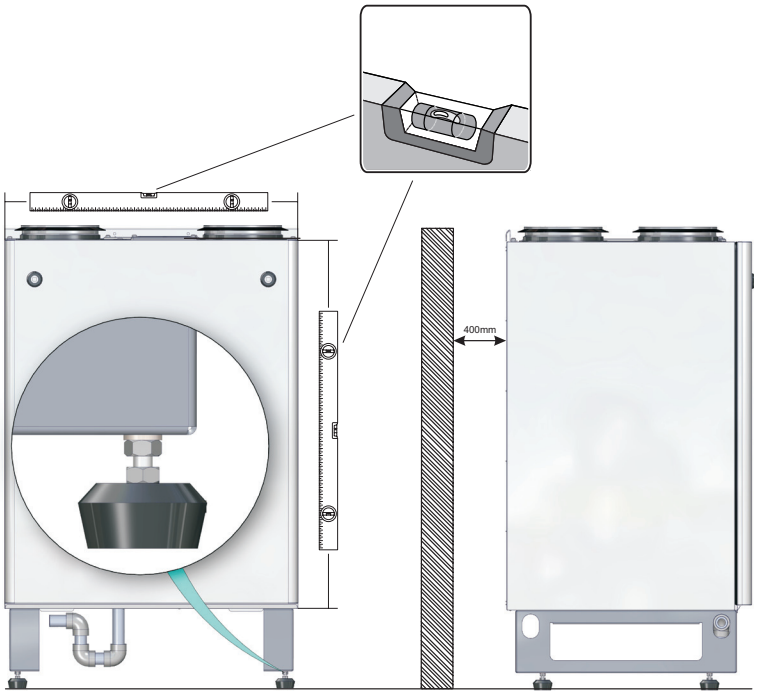
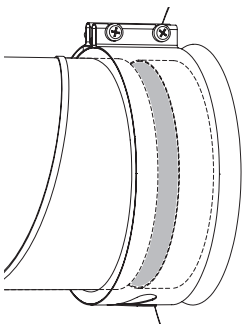
372
113
115,60
115,60
233,80
150,60
150,60
ø 160

Mounting v1

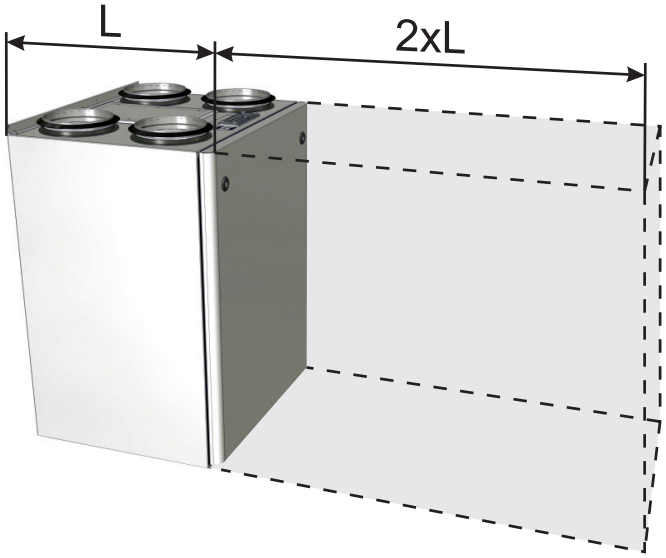
- - Installing should be performed only by qualified and trained staff.
- - The unit should be mounted on the flat horizontal surface so that the product is not leaning.
- - When connecting air ducts, consider the notices indicated on the casing of the unit.
- - Before connecting to the air duct system, the connection openings of ventilation system air ducts should be closed.
- - When connecting air ducts, consider the directions of air flow indicated on the casing of the unit.
- - Do not connect the elbows in vicinity of the connection flanges of the unit. The minimum distance of the straight air duct between the unit and the first branch of the air duct in the suction air duct must be 1xD, in air exhaust duct 3xD, where D is diameter of the air duct.
- - It is recommended to use the accessories/holders (Pic. 01) for connection of the fan to the air duct system. This will reduce vibration transmitted by the unit to the air duct system and environment.
- - Installation shall be performed in such manner that the weight of the air duct system and its components would not overload the ventilation unit.
- - Enough space must be left during installation for opening of the maintenance door of the ventilation unit.
- - If the installed ventilation unit is adherent to the wall, it may transmit noise vibrations to the premises even though the level of noise caused by the fans is admissible. The installation is recommended at the distance of 400 mm from the nearest wall. If it is not possible, the installation of the unit is recommended on the wall of the room where the level of noise is not important.
- - Also, vibrations can be transmitted through the floor. If possible, additionally insulate the floor to suppress the noise.
- - Pipes are connected to the heater in such way that they could be easily disassembled and the heater could be removed from the unit casing when performing service or repair works.
- - Supply air heater (EKA) and fresh air preheater (EKA NIS) must be installed not closer than 1 m from the device flanges.
- - Install the supply air temperature sensor in the supply air duct. Supply air temperature sensor (TJ) must be installed behind all air handling equipment (coolers, heater), and as far as possible away from them, or according to the limits of the sensor cable.
- - For the usage of motion sensor (PIR) for the unit‘s control or for connection of smoke alarms (DJ), it is necessary to provide separate power supply. There is no power supply possibilities for these accessories in unit‘s automation.
- - Two pressure or one CO2 converter can be connected to unit‘s automation as attachments. Converters‘power supply (24VDC) is built into the automation.
- - When using DX cooler we recommend to use the differential pressure rely for cooler protection (PS600).
- - Device power cable (CEE7 / 7) with a plug must be installed in a visible and accessible place for easy disconnection from its socket.



Pic. 01



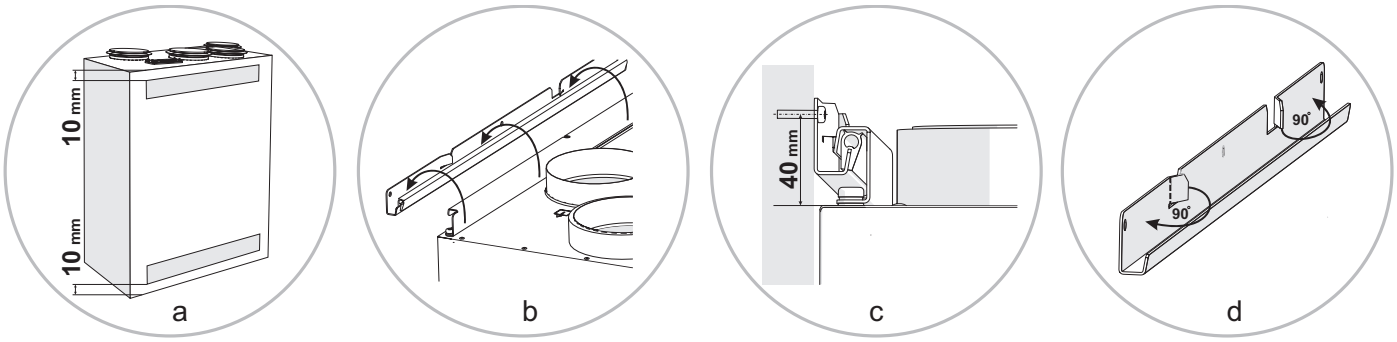
Pic. 02



Montavimas v2

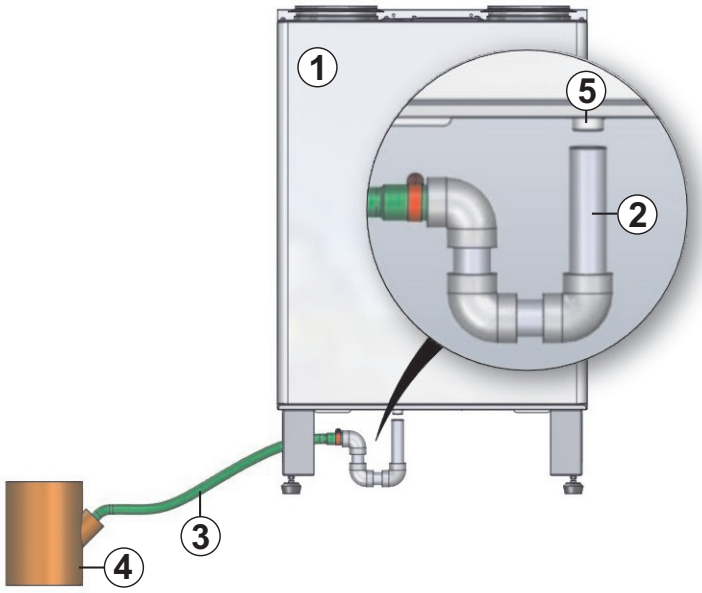
- Installing should only be performed by qualified and trained staff.
- The unit must be installed firm and tight, it will ensure its safe use.
- When installing the unit on the wall prepared accessories should be used for that purpose as shown (Pic. 2). The unit mounted on the wall shouldn't be leaning.
- Before connecting to the air duct system, the connection openings of ventilation system air ducts shall be closed.
- When connecting air ducts, consider the directions of air flow indicated on the casing of the unit.
- Do not connect the elbows in vicinity of the connection flanges of the unit. The minimum distance of the straight air duct between the unit and the first branch of the air duct in the suction air duct must be 1xD, in air exhaust duct 3xD, where D is diameter of the air duct.
- Installation shall be performed in such manner that the weight of the air duct system and its components would not overload the ventilation unit.
- Enough space 2xL (L is the depth of the unit) must be left during installation for opening of the maintenance door of the ventilation unit.
- It is recommended to install the unit on the wall of the room where the level of noise is not important.
- When installing the unit on the wall is necessary to isolate the wall additionally to suppress the noise and vibrations. Also isolate wall mounting accessories from possible vibration.
- Install the control panel on the foreseen place according to the mounting instructions provided in control panel technical manual.
- Stretch the connection cable, which is included into standard package, between the control panel and control box. The cable of the control panel can't be stretched together with power cables. Due to insufficient control panel cable stretching disturbance between the unit and control panel can be caused.
- Connect all necessary (including additionally ordered) accessories to the units control system X16 assembly.

Pic. 02



a) To reduce the vibration stick the insulating tape on the unit's casing side which touches the wall before mounting the unit on the wall.
b) The unit has to be mounted on the mounting brackets.
c) AHU mounting drawing.
d) After the unit is mounted two wall bracket tabs has to be folded to 90 angle by pliers to avoid the accident fall of the unit.

Drainage

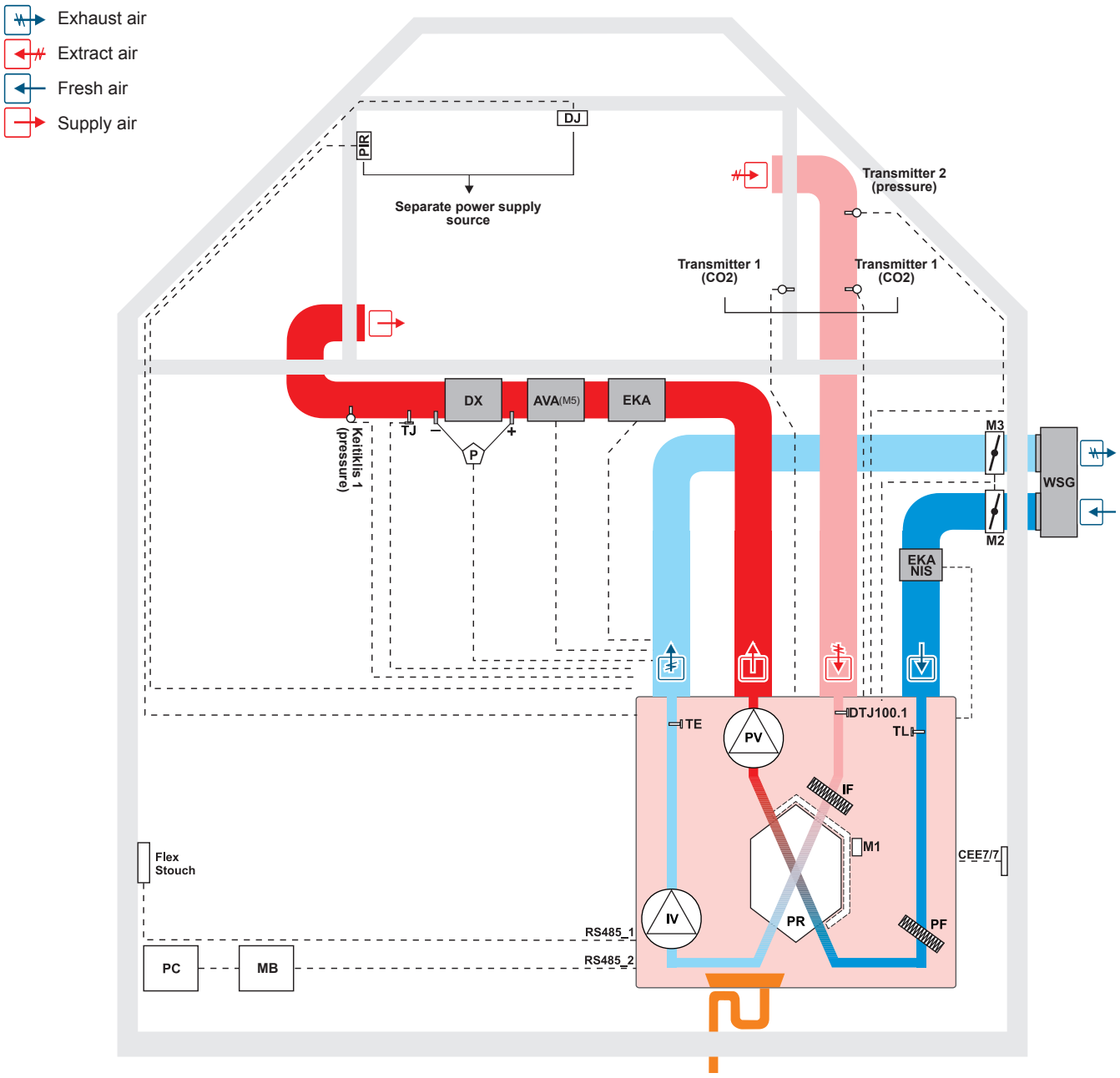


When AHU (1) is already mounted the draining system has to be connected. In order to do that the coupling (2) must be screwed to the AHU draining chute (5). The system must be connected with metal, plascic or rubber pipes (3) in such order: AHU (1), siphon (2) and sewerage system (5). Pipes (3) should be bended not less than 3° degrees (1 meter of pipe must be bended 55 mm downwards)! Before turning on AHU (1) the draining system should be filled up with at least 0,5 l of water (siphon (2) must be always filled with water), also check if water reaches sewerage system (4)! In other case premise can be flooded.

Draining system must be installed in the premise where the temperature is not lower than 1°C. If temperature falls below 0°C the draining system should be isolated with thermal isolation.

The Siphon (2) not necessarily must be mounted below the AHU (1), but below the 1st AHU level.

Principle mounting diagram



IV	Extract air fan
PV	Supply air fan
PR	Plate heat exchanger
PF	Filter for supply air (F7)
IF	Filter for extract air (M5)
DTJ100.1	Extract air relative humidity and temperature sensor
TL	Fresh air temperature sensor
TE	Exhaust air temperature sensor
PIR	Motion detector
DJ	Smoke detector
TJ	Supply air temperature sensor
CEE7/7	Power cable with plug
RS485_2	BMS network connection place
RS485_1	Control panel connection place

PC	Personal computer
MBGateway	Net module
Flex	Control panel
Stouch	Control panel
M2	Fresh air damper actuator. Recommended to use with return spring
M3	Exhaust air damper actuator
WSG	Supply and exhaust air grilles
EKA NIS	Electric pre-heater
EKA	Electric heater
AVA (M5)	Water cooler. There is only actuator control signal from automatics.
DX	DX cooler. There is only control signal from to unit's automatics.
P	DX cooler's safety differential pressure relay (PS600)

Accessories

VXP

3-way valve PRGV015

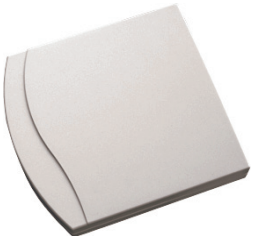
VVP

2-way valve PRGV005

S-KCO2

CO_2 sensor ZAKKT0049

S-RCO2-F2



CO_2 sensor ZAKKT0048

S-1141

Pressure transmitter ZAKKT0047

SKG 160

Shut-off damper GSKSKG003

CM230-1-F-L

Actuator for damper ZAKP0027

TF230

Spring return actuator for damper ZAKP0063

MPL

Panel filter set GKOFILSMARTY3

SSB81 200Nm

Actuator for water valve PRGP006

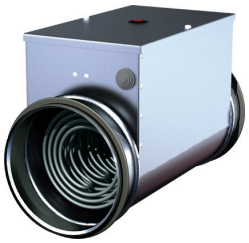
FLEX

Remote control panel PRGPU015

Stouch

Remote control panel PRGPU51

EKA 160 0.3-1f

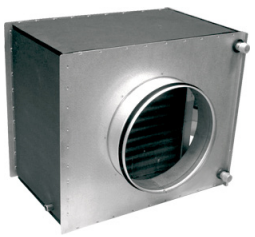


Electric heater PSIEKA075

EKA NIS 160 1.0-1f PS

Electric preheater PISEKANIS03

AVA



Water cooler GSIAVA003

WSG

Supply and exhaust air grill GGRWSG0126_509

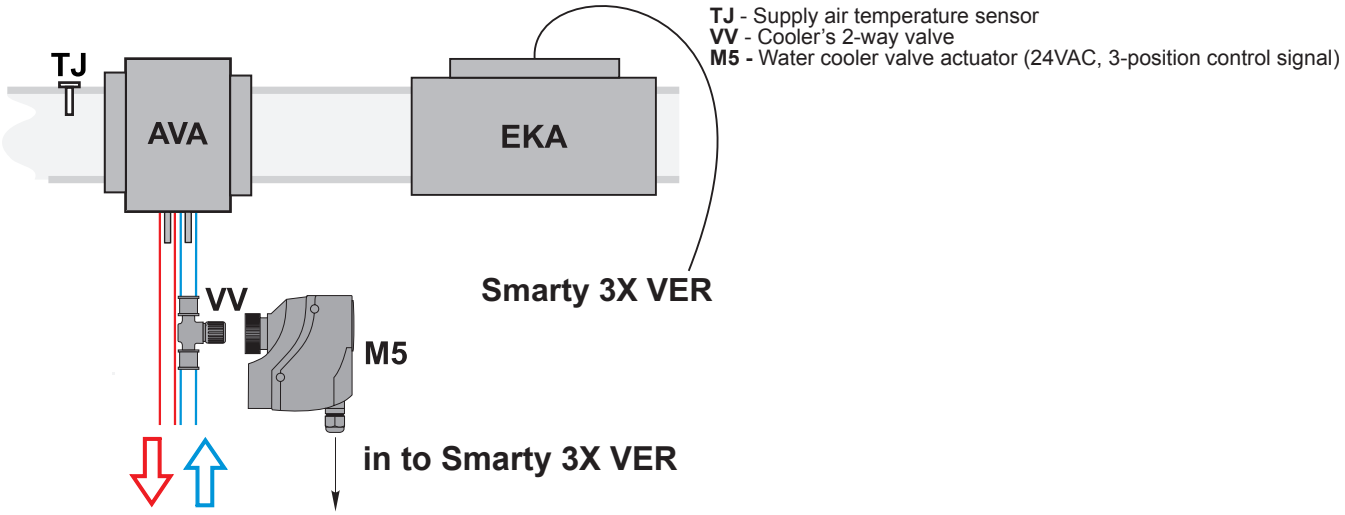
PS600

Differential pressure rely and Switch PS600B set ZAKJT003

MB Gateway

Net module GAUMBGATEWAY001

AVA mounting



TJ - Supply air temperature sensor
VV - Cooler's 2-way valve
M5 - Water cooler valve actuator (24VAC, 3-position control signal)

Description of the functions

Recommended remote controllers:

For user and service – „FLEX“

Only for the user –„Stouch“

1. Heat exchanger's protection, the usage of fresh air electric pre-heater

The proper functioning of the device, at outside air temperatures below -5, is guaranteed by using fresh air pre-heater (to be ordered additionally). It provides the necessary fresh air temperature at which the system can operate without disruption at optimally sustaining consumption of electricity.

Performance

Fresh air pre-heater is turned on at the risk of freezing. It is controlled by PID (proportional-integral-derivative controller) controller by 0-10 V signal according to exhaust air temperature sensor "TE" and the set (service menu items) exhaust temperature limit.

Other information

Anti-frost temperature (outside air temperature) limit is set by practical experimental way at + 21 °C of extracted air temperature and 50% relative humidity. By default fresh air temperature +1 °C is preserved by pre-heater. When the temperature reaches -3°C, anti-frost protection stars to work. Pre-heater (EKA NIS) for anti-frost protection has to be ordered additionally. The pre-heater has overheat protection (protection limiting the temperature) which starts at + 50 °C and manual which starts at +100°C.

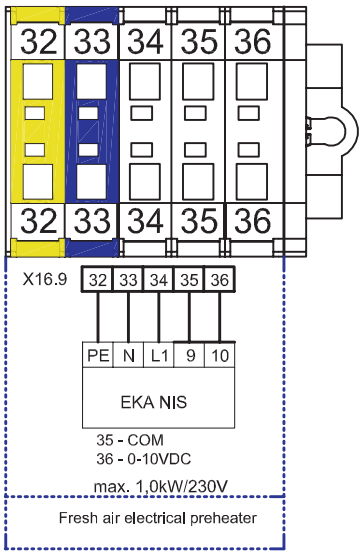
Adjusting and setting of the function

Default configuration for unit's safe and effective operation is - outdoor temperature lower than -5 °C. That's why the change of the settings is FORBIDDEN:
Menu -> Extra -> Service -> AF1 -> OutDoorTemp – (temperature, which the pre-heater has to preserve according to fresh air sensor LT). Default value +1 °C.

Configuration is impossible with "Stouch"

Connection of a functional node to a ventilation unit:

A preheater is connected to a terminal block of a unit control system “X16”:



Purpose of the terminals:
32 – protective earth (PE)
33 – neutral (N)
34 – supply phase (L1)
35 – control (COM)
36 – control (0-10VDC)

Maximum permissible connection power is 1kW (230V 50Hz)

2. Supply air temperature control, supply air electric heater control

Supply (indoor) air temperature can be controlled by:
• Supply air temperature sensors.
• Extract air temperature sensors.
• Supply or extract air temperature sensors with respect to summer/winter mode temperature “OutDoor T.C” (Summer/winter mode set temperature).

If required, the supply air heater (EKA) may be additionally connected to the unit control system (see below). When it is used the supply air temperature value may be increased up to the desired value.

Operation:

Where the supply air temperature is controlled by the supply air temperature sensor “TJ”, the set value (in a remote control) is compared to measured values of the supply air sensor and, if there is a heating demand, the heat exchanger bypass valve is closed and only then the additionally connected supply air heater is switched on. These processes are controlled according to the PID controller. The heater of air supplied for heating is switched on (by means of the PID controller).

Where the supply (indoor) air temperature is controlled by the extract air temperature sensor “DTJ100.1”, the indoor air temperature is maintained by the controller using (comparing) the following values:
• Minimum indoor (extract air) temperature
• Maximum indoor (extract air) temperature
• Temperature set by the user

The unit’s automation maintains the extract (indoor) air temperature within minimum-maximum (Min Supply, Max Supply) temperature limits upon the evaluation of the temperature set by the user in the remote control. This way too cold or hot air supply to the air transportation system is prevented. At the same time the supply air temperature sensor limits the heater’s power and the additionally protected electrical heater is protected against overheating or accidental oxygen “burning”.

The electrical supply air heater is controlled according to the PID controller on the basis of the “on/off” control principle. When the unit is switched off, the heating elements are cooled. This period may be changed by the remote control (“Flex” only).

Other information:

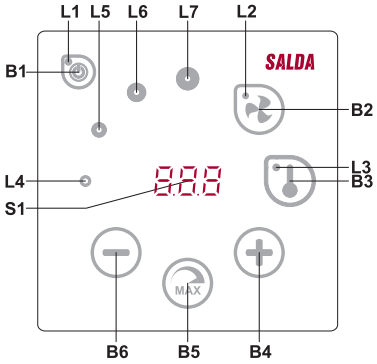
The heater (EKA) is ordered individually. The heater has the automatic protection against overheating (temperature limiting protection) which is actuated at 50°C and manual protection which is actuated when 100°C is reached.

Function adjustment, setting:

By **“FLEX”** remote control: “Set temperature” means that the desired supply or extract indoor air temperature is set between 15 and 30 °C.

Fan speed	low
Set temperature	20 °C
Meniu	**19** °C
Supply air temp.	18 °C
Deicing	
7:28 **2013-06-04** Sun	

By **“Stouch”** remote control



B3	Temperature setting
B4	Increase
B6	Reduce
S1	Segment display

It is possible to set the desired temperature between 15 and 35°C in the remote control.

The temperature control principle may be selected only by “Flex” remote control:
Additional > Vent.Ctrl. > Mode

Additional	1/10
Exit	
ModBus	**76** %
Vent. Ctrl.	**20.2** °C
Coll. Ctrl.	**19.2** °C
Add. Func.	**-2.3** °C

- „Supply“ - default setting
- „Room“ - by extract air temperature
- „ByOutDoor“ – by the supply or extract air temperature sensor depending on the summer/winter mode temperature “OutDoor T.C”.

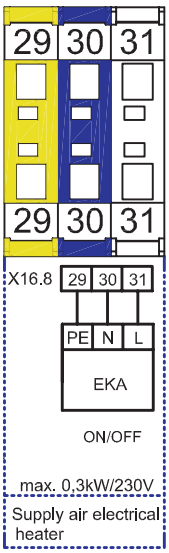
Minimum, maximum supply air temperature and summer/winter mode temperature can be set only by “Flex” remote control:
Additional> Vent.Ctrl.> Mode

- “Min Supply” – minimum permissible supply temperature, 12-24°C. Default value: 15°C
- “Max Supply” – maximum permissible supply temperature, 25-40°C. Default value: 40°C
- “OutDoor T.C” – selecting summer/winter temperature, 10-30°C. Default value: 16°C

Time to cool heating elements upon switching off the unit may be configured by Flex remote control (default value – 60 seconds):
Menu > additional >Add.Func.> FanStopTime (factory settings).

Connection of a functional node to a ventilation unit:

A preheater is connected to a terminal block of a unit control system “X16”:



Purpose of terminals::
29 – protective earth (PE)
30 – neutral (N)
31 – supply phase (L1)

Maximum permissible connection power is 0.3 kW (230V 50Hz)

3. Supply air cooling, DX (Direct Expansion) and water cooler control

The following may be used for additional cooling of supply air:

- Freon (DX) cooler
- Water cooler

The unit control automation is designed to control one cooler at a time (water and freon coolers).

Operation:

When a cooler is connected to control automation and control algorithm determines that cooling is required and the cooler is switched on, the freon and water coolers are activated simultaneously. The switch-on temperature of air coolers can be adjusted individually, i.e. at which outdoor temperature the cooler can be switched on (used). When cooling is performed by a freon or water cooler, the minimum supply air temperature is limited. This way the forced condensate accumulation on external walls of the air transportation system is prevented. This temperature may be adjusted. Switch-on/switch-off cycles of the freon cooler may be adjusted. Also, the controller programme has delays for protection of the freon cooler compressor. This enables the proper system adjustment by means of coolers of different capacity. The differential pressure relay may be used for the freon cooler protection (PS600). At the higher pressure difference in the cooler the control signal sent to the freon cooler control circuit is cut.

Other information:

The unit control automation is designed only to:

- Freon cooler one-stage switch-on, i.e. the signal (relay) is sent to activate the freon cooler control system.
- Water cooler drive 3P (three-position) control. If the freon cooler is not used, the water cooler circulating pump may be connected to control terminals of the freon cooler.

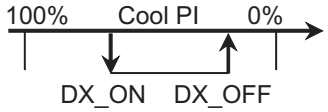
Water coolers (AVA) are ordered individually. Freon coolers are ordered individually.
The pressure relay (PS600) may be additionally used for the freon cooler protection. It is ordered individually.

Function adjustment, setting:

The cooler operation may be configured only by “Flex” remote control.

Additional > Cool.Ctrl
- “Min Supply” – minimum supply air temperature by cooling, 0–15°C. Default value: 6 °C
- “OutDoor T.C” – cooling is permitted, where outdoor temperature exceeds this setting, 10–30°C. Default value: 12°C
- “Dx coolON” – freon cooling is switched on at “Cool PI“, %. Default value: 23%
- “Dx coolON” – freon cooling is switched off at “Cool PI“, %. Default value: 20%

Example of adjustment:



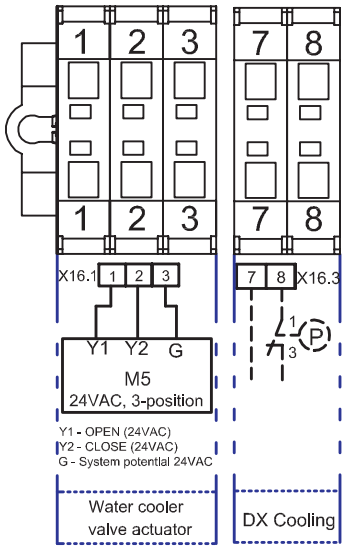
Where the water cooler pump control is used, it is necessary to set the following parameters to ensure its correct performance:

Menu -> Extra -> CoolCtrl –> DX_CoolOn = 1%

Menu -> Extra -> CoolCtrl –> DX_CoolOff = 0%

Connection of a functional node to a ventilation unit:

Coolers are connected to the terminal block “X16” of the unit control system



Water cooler actuator (M5): 3-position
1 – actuator is opened (24V AC), on/off
2 – actuator is closed (24V AC), on/off
3 – positive actuator potential (24V AC), fixed

When the freon cooler is not used, the water cooler circulating pump may be connected to terminals 7 and 8. In this case the system installer must design:
• Separate pump power supply source with service phase (L), neutral (N) and protective earth (PE).
• Separate pump protection unit (circuit breaker or fuse) based on its rated power (operating current).

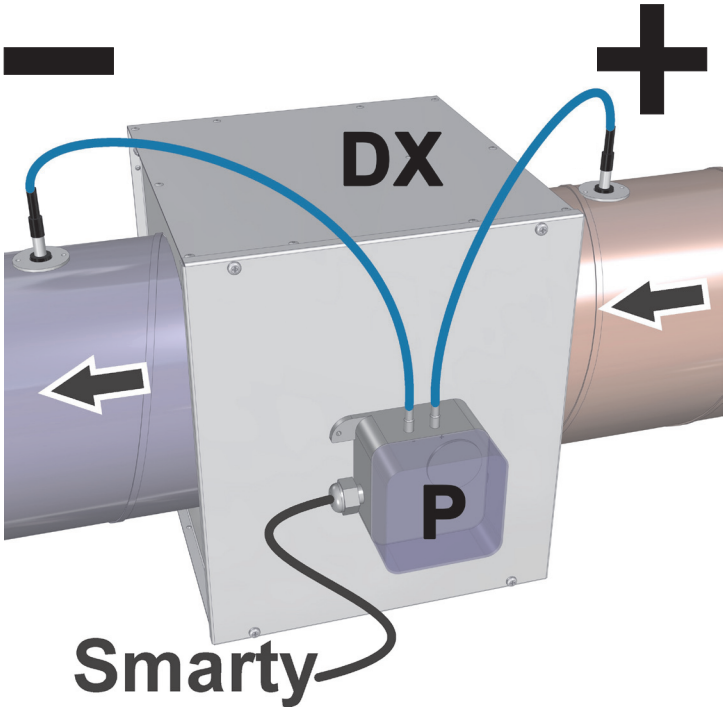
Freon (DX) cooler or water cooler circulating pump
7;8 – relay output

P – differential pressure relay for the freon cooler protection. Relay actuation point must be adjusted by the system installer upon the evaluation of the pressure drop in the cooler. The pressure relay actuation limit is changed by turning its handle at the value of the required pressure difference).

PS600

Connection of pressure relay hoses and status in the air transportation system

„+“ – higher system pressure
„-„ - lower system pressure



4. Fan speed control, constant pressure of air transportation system, reduction of CO2 indoors and configuration of these functions

Fan speeds may be changed by selecting the required fan operation mode (at fixed speed) or by using additional air quality transmitters (CO2 or pressure transmitters). The maximum unit operation mode “boost” can be used for a prompt air change at the premises. It may be activated by a button or another device, e.g. by using the PIR motion sensor or external button (with the on/off function).

Operation:

The unit air output can be changed by changing fan speed:
• Manually (selecting relevant fan operation mode)
• Automatically (by pressure transmitters or CO2 transmitters)
• Forced (maximum/“boost”)

The following operation modes can be selected manually:
• “Building protection”
• “Minimum”
• “Rated”

Fan speed is controlled automatically when the following devices are used:
• Pressure transmitters (2 pcs). In this case, the fan speed is automatically adjusted with respect to system pressures.
• CO2 transmitter. In this case, the fan speed is automatically adjusted with respect to the CO2 level in the extract air flow channel or at the premises.

When automatic fan control speed is used, the optimal unit operation with minimum energy costs is achieved.

The maximum fan speed (maximum/“boost”) can be forced by:
• fast button remote controls
• digital input “boost” (default parameter)

This fan operation mode can be used, where prompt indoor air changes are required at the increase of air pollution (e.g. if the number of people in a room quickly increases). The fan speed, in this case, is increased up to the set maximum/“boost” value.

The maximum speed value and operation time may be configured by remote controls.

Other information:

Modes of each fan speed can be configured individually, i.e. different values can be selected for each speed. If differential pressure transmitters are connected to the unit control system, different pressure values of the air transportation system can be individually set in different speed modes. The configuration of different speed modes enables the proper balance of air flows. Control principles for every fan can be selected individually. Control can be selected by percentage values or the system pressure (by means of pressure transmitters). Pressure transmitters (1141) are ordered individually. Having installed the unit with the pressure support system (or without it), the installer must adjust the system. Where the air quality transmitter (CO2) is used, it is necessary to indicate the maximum permissible ppm (part per million) level in the remote control.

System control (configuration) based on pressure transmitters or CO2 transmitter, where they are connected to the unit control system (automation terminal block X16), is possible only by means of “Flex” remote control.
Where “Stoch” remote control with pressure transmitters or CO2 transmitter connected to the unit control system is used (automation terminal block X16), its control (configuration) is not possible.

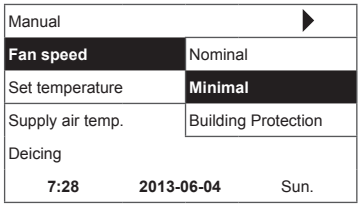
Standard speed configurations:

• Building protection – 31%, motor operating voltage 2 V±5%,
• Minimal – 45%, motor operating voltage 3,1V±5%,
• Nominal – 74%, motor operating voltage 5,1V±5%,
• Boost/židinys – 130%, motor operating voltage 10V.

Having selected the “building protection” speed, the unit operates at the “economic temperature” which may be changed in the remote control (the range between +15 and +30C). Economic temperature is the temperature maintained when the unit is operating in “building protection” mode (default value 18C).
Where other operation modes are selected, this temperature is eliminated (no longer used).
Where a respective fan control principle is selected (percentage value or by a pressure transmitter), it is possible to select the way for displaying values on the remote control in the service menu items “Vent. Control” (setting fan readings), i.e. “%” or “Pa” (password required). Where control by pressure transmitters is selected, the service menu items are used to set the minimum and maximum limits of the pressure transmitter input. If the transmitter setting is max 330, “SAFhigh” cannot be set more than 5% of max, i.e. in this case, “SAFhigh” would allow the setting of 313 Pa.
To balance air flows the fan speed deviation adjustment function can be additionally used. i.e. the extract air speed i adjusted according to the supply air speed upon the evaluation of the speed deviation percentage value “EAF Ctrl”. It can be configured in the service menu.
The set “Maximum/“boost” values are used in other active modes, e.g. CO2 reduction mode at the premises or when the “fireplace function” is on. To activate “Maximum/“boost” mode by means of a digital input, a button, for example, can be used (without fixation). To activate the function it must be held down for 5 seconds. This mode can be switched off earlier while the function is still on (after its activation), just hold down the button for 5 seconds.

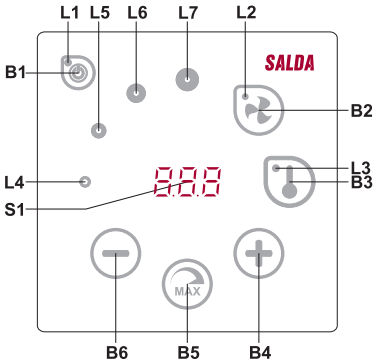
Function adjustment, setting:

Speed selection by “FLEX” remote control. Speed is selected in the main window of the remote control.



Selection of fan speed control principles:
Selection is possible only by “Flex” remote control. The selection is performed as follows: Menu > additional > Service (password)>VentCtrl.
SAF (supply air fan)
EAF (extract air fan)
SAF and EAF possible options: per cent – where it is controlled by percentage values; pressure – where it is controlled by pressure transmitters.

Speed selection by “Stouch” remote control



B2	Fan speed setting
B4	Increase
B5	Maximum fan speed, limited period of time (boost)
B6	Reduce
S1	Segment display
L4-L7	Fan speed indications

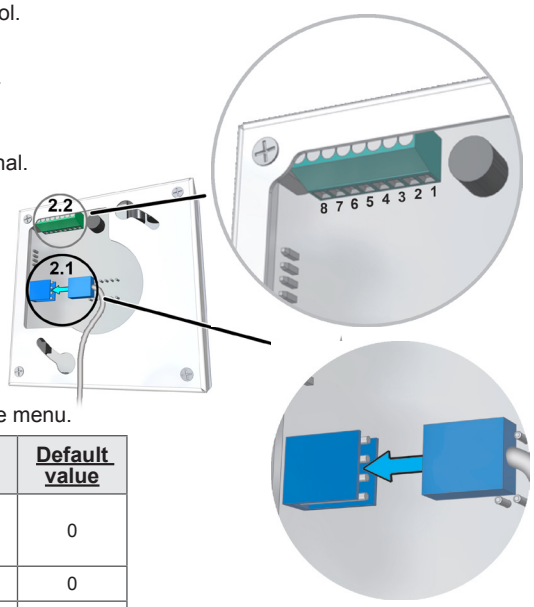
Where the CO2 transmitter is connected to the unit, configuration can be performed by “Flex” remote control:
In the remote control select Menu>Additional>Service(password) >Vent. Control.
The parameter CO2 value is changed to On.In the remote control select Menu>Additional>Service(password) >Vent. Control.
The parameter CO2 value is changed to On.
In the remote control select Menu>Additional>Service>CO2”. Based on parameters of the CO2 transmitter, set the CO2 level (in ppm measuring units) which is indicated at the 0 V limit (min_0V parameter, default value 0 ppm) and the level at the 10 V limit (max_10V parameter, default value 1,000 ppm).
In the remote control select Menu>Additional>Service>CO2. Set the excess over the permissible CO2 level at which fans rotate at the maximum speed (PPM_100% parameter).
In the remote control select Menu>Additional>Add.Func. Set the maximum permissible CO2 value which, when exceeded, leads to the increased supply air flow (CO2 parameter).
In the remote control, in the menu Sensor Readings, the instantaneous extract CO2 value is displayed.
Where the permissible set CO2 level is exceeded, the primary display shows the information message “High CO2 level” and the fan speed is increased in proportion to the exceeded permissible limit.
By default, the unit control automation control by the CO2 transmitter is switched off: Menu>Additional>Service(password) >Vent. Control.>off

Where the CO2 transmitter is used (by “Stouch” remote control):
In the remote control (Flex) select Menu>Additional>Service(password) >Vent. Control.
The parameter CO2 value is changed to OFF.

The system installer shall design the transmitter power supply and protection circuits.
Power supply parameters are indicated in the technical passport of the transmitter.

The system installer shall connect the transmitter analog output signal to screw terminals 6 and 7 of the Stouch remote control. 6 - GND (ground); 7 – 0–10VDC signal.

Power to the sensor is supplied from a separate power supply source.



Keitiklis maitinamas nuo atskiro maitinimo šaltinio. Būtina sistemos instaliuotojui numatyti maitinimo šaltinio apsaugą.

CO2 settings by **“Stouch”**
The CO2 transmitter and its parameters shall be indicated through the Stouch service menu.

No	Description	Possible value	Default value
F. 14	Transmitter	0: No 1: Pressure 2: CO2	0
F. 15	Transmitter MIN	0-250 x10	0
F. 16	Transmitter MAX	1-250 x10	20

The user shall indicate CO2 level support parameters through Stouch.

No	Description	Possible values	Default value
P.04	CO2 required (ppm)	0 – 99 x10ppm	20 x10
P.05	CO2 lpermissible difference	0 – 99 x10ppm	5 x 10

If the permissible CO2 difference is exceeded above the required one, the remote control activates “boost” speed, CO2 message is shown on the display. Where CO2 reaches the required limit, the previous speed is automatically reset.

Economic temperature is set only by “Flex” remote control:
Menu>Menu configuration > Economic temperature.
Possible selection values 15–30 C
Default value: 18 C

Maximum/“boost” mode; supply, extract air fan speeds; percentage deviation configured (by “FLEX” remote control):
Menu > additional > Boost Ctrl.”
• “Boost timer” – “Boost/fireplace” function action duration, min (possible selection values between 0 min and 255 min). Default value: 0
• “Boost SAF” – supply air fan speed during the “Boost/fireplace” function action, %, Pa. Default value: 130%
• “Boost SAF” – extract air fan speed during the “Boost/fireplace” function action, %, Pa. Default value: 130%

Supply air fan speed may be configured as follows:
Meniu > Extra >SAF Ctrl.
SAF low.....

Extract air fan speed may be configured as follows:

• “EAF Ctrl.” – setting extract air fan speed or pressure (depending on the configuration) or percentage deviation setting -20+20% of the supply air fan setting. Default value: 0%
Where control is performed by pressure transmitters, the minimum (min_0V) and maximum (max_10V) limits of the pressure transmitter input are set (by “FLEX” remote control):
„Meniu“ > “Additional” > “Service” .“PSI“

• “min_0V” – Pa
• “max_10V” –, Pa

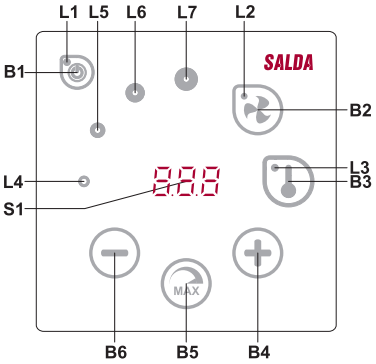
Where control is performed by the CO2 converter, the maximum permissible CO2 value is set; if it is exceeded, the supply and extract air flow is increased (by “FLEX”)
Meniu>>Additonal>Add.Func.>CO2

• EAF Low – the extract fan speed is set at the selected speed “low”, %, Pa.
• EAF Midd– the extract fan speed is set at the selected speed “middle”, %, Pa.
• EAF High– the extract fan speed is set at the selected speed “high”, %, Pa.

Maximum/“boost” mode adjustment by “Stouch” remote control:
Maximum/“boost” speed is protected by a timer which can be easily changed by running the maximum fan speed (boost). Maximum speed is activated by the fast button. When the maximum set fan speed (boost) time is over, the previous speed is automatically reset.

Where Stouch remote control is used, all settings made by Flex remote control become inactive. All settings of this function must be made by Stouch remote control.

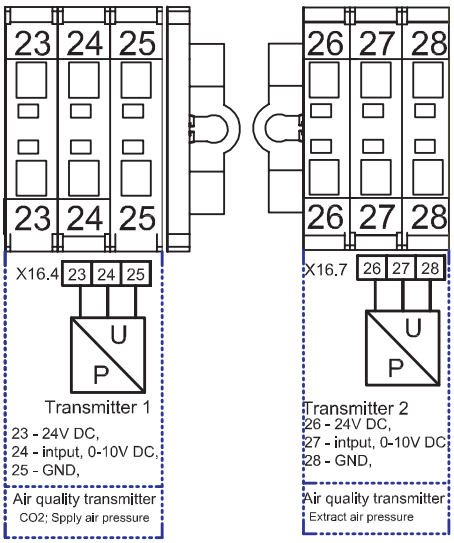
Time can be configured:



Elements	Command	Action	Indication
B4 B5 B6 L2	Intense ventilation function(boost) switch-on/switch-off	Hold B5 for 2 seconds.	L2 flashes. The segment display shows the remaining time in seconds (time above 600 s is shown in minutes). Time is adjusted by touching B4 and B6.

Connection of a functional node to a ventilation unit:

To maintain the constant pressure in the air transportation systems (supply and extract air), it is necessary to use two pressure transmitters (1141). They are ordered individually.

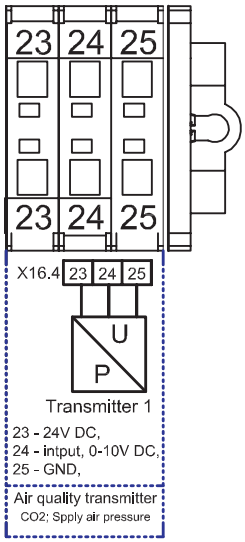


The supply air pressure transmitter (transmitter 1) is connected:
23 – power supply to the transmitter. 24V DC
24 – input from the transmitter, 0–10V DC
24 – power supply to the transmitter, GND

The extract air pressure transmitter (transmitter 2) is connected:
26 – power supply to the transmitter. 24V DC
27 – input from the transmitter, 0–10V DC
28 – power supply to the transmitter, GND

Pressure transmitters are used only when connected by Flex remote control.

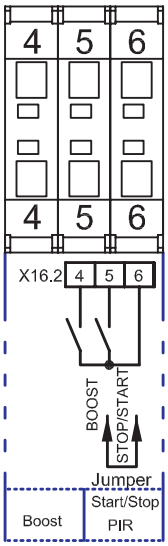
To reduce CO2 concentration at the premises the CO2 transmitter must be connected (channel transmitter or installed indoors).



The extract air CO2 transmitter (transmitter 1) is connected:
23 – power supply to the transmitter. 24V DC
24 – input from the transmitter, 0–10V DC
24 – power supply to the transmitter, GND

Presssure transmitters are used only when connected by Flex remote control.

The use of forced ventilation (“boost”) by a digital input. To activate this function a button or motion sensor (PIR) can be used.



4;5 – connection of an external button or PIR sensor

5. Unit control

The function “start/stop” can be used for more convenient automatic switch-on or switch-off of the unit. This function helps to control the unit, for instance, from the building protection system, door lock or motion sensor PIR PIR (passive infra-red sensor). Where the motion sensor is used, the unit is switched on or off depending on the number of people present in the room.

Operation:

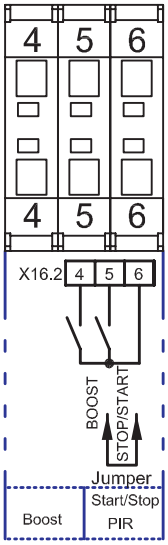
When the digital input of the “start/stop” controller is switched on, the unit is on. When it is switched off, the unit is off. To activate the unit it is necessary to use the NC (normally closed) contact in the digital input. The unit is switched off using the NO (normally open) contact.

Other information:

The PIR sensor is ordered individually. Power supply to the sensor shall be designed by the system installer; it is not designed in the unit automation. The installer shall take all precautionary measures regarding its proper connection.

Connection of a functional node to a ventilation unit:

To use this function, the short circuiter must be removed from terminals 5 and 6 – its installation is standard.



5,6 – PIR, building alarm system, door lock input
NC – the unit is on
NO – the unit is off

6. Indication of unit mode

The unit automation has the additional indication designed, i.e. where light indication is connected, it is possible to identify the status of the unit: the unit is on and it is operating without interruptions; unit failure. This additional indication can be used to inform the persons in charge on the status of the unit.

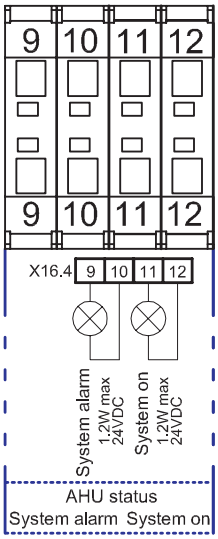
Operation:

Where a unit is on and there are no faults, the indication “AHU work” is on. In case of any failure of the unit – “AHU stop”.

Other information:

Light indication shall be installed (if required) by the system installer. Light indication is not included in the standard set of the unit.

Connection of a functional node to a ventilation unit:



9 – Positive potential (+24VDC) “AHU Stop”
10 – Negative potential (-24VDC) “AHU Stop”
11 - Positive potential (+24VDC) “AHU Work”
12 - Negative potential (-24VDC) “AHU Work”

Maximum power of one light indication cannot exceed 1.2W

7. Control of supply and extract air damper actuators

Supply and/or extract air damper actuators can be connected to the unit. They are opened when the unit is on, and they are closed when the unit is off.

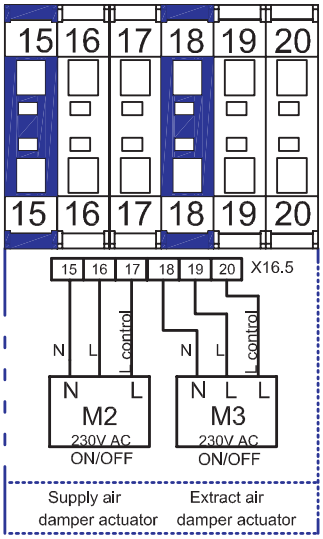
Operation:

Supply and extract air damper actuators are controlled by the “on/off” principle. When the signal is sent (to the controller) to start the unit, dampers are opened. Fans are switched on only in ~10 s. Time delay is necessary to prevent the vacuum formation in the unit. When the signal to stop the unit is received, fans are stopped and dampers are closed. When the dampers are closed, the control voltage is maintained for 4 min 15 s. This time delay guarantees that dampers are fully closed. 4 min 15 s later all damper control signals become inactive until the next start-up of the unit.

Other information:

Supply and/or extract air damper actuators are ordered individually.

Funkcinio mazgo prijungimas prie vėdinimo įrenginio:



Supply air actuator (M2)
15 – Supply air actuator (M2) neutral (N)
16 – Supply air actuator (M2) phase (L1), steady signal
17 – Supply air actuator (M2) phase (L1), control variable signal

Extract air actuator (M3)
18 – Supply air actuator (M3) neutral (N)
19 – Supply air actuator (M3) phase (L1), steady signal
20 – Supply air actuator (M3) phase (L1), control variable signal

Actuator supply voltage: 230V 50Hz

When the water cooler is used, we recommend to connect the spring return actuator. This will ensure the water cooler protection in case of the unit supply voltage loss. In this case M2 actuator is switched on as follows:

15 – Supply air actuator (M2) neutral (N)
17 – Supply air actuator (M2) phase (L1), control variable signal

8. Fire safety

The fire alarm signal from the building fire centre can be connected to the unit control automation. In case of fire (or risk of fire) the unit is switched off and the message is shown on the display.

Operation:

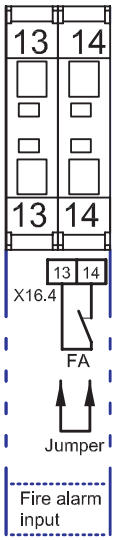
The risk of fire is identified when a low-level signal (NO) is formed in a relevant input of the unit controller, i.e. the risk is recorded when the signal is cut in the controller digital input. At this mode the unit is switched off. To re-activate the unit it is required to confirm the message in the remote control.

Other information:

If supply voltage is lost and reappears, the unit is operating according to the last settings. The risk of fire is recorded in 5 seconds after the signal is cut (when NO (Normally Open)).

Connection of a functional node to a ventilation unit:

To use this function, the short circuiter must be removed from terminals 13 and 14. It is normally installed by the manufacturer.



9. Summer/Winter mode setting

In the service menu there is an option to select parameters under which seasons change. 4 options are available: by three-day medium outdoor temperature, by a date set in a calendar and there are separate manual switches for winter/summer seasons.

Operation:

This mode (when “winter” is indicated) impacts the restriction of the unit switch-off in winter. Normally, the unit can be off not longer than 2 h/day during the winter season. 2 hours later the unit is switched on automatically and it operates according to the last settings.

Function adjustment, setting:

Only by “FLEX” remote control (password required)
Menu > Additional> Service > Seasons>Menu configuration>Seasons

- “Select a season” – select the parameter for changing seasons (default parameter – “3 day average”:
- 3 day average – by 3-day medium outdoor temperature (default temperature is 10°C).
- Calendar – by the set date, to be set
- Summer – manual switch-on of the summer season
- Winter – manual switch-on of the winter season

- “Settings” – winter/summer settings:
- “Outdoor temperature” – outdoor temperature is set to calculate the 3-day average (0-20°C); when the outdoor temperature drops below the set value within three days, the function “OFF permit” is enabled
- “Summer” – the date of the summer season beginning, where “Calendar” is selected
- “Winter” – the date of the winter season beginning, where “Calendar” is selected

Only by “FLEX” remote control (password required)
Menu > Additional> Service > Seasons>Menu configuration>Seasons

- “OFF mode” – unit shut-down option.
- “OFF time” – {24h – 0h} how long the unit can be off based on the selected season:

  24h – off time is not limited, the items “OFF season” and “Seasons are not used.
  Xh – during the selected season the unit can be switched off only for a period of the selected number of hours per 24 hours.
  0h – it cannot be switched off during the selected season.
  “OFF Season” – {in summer, winter, always} during which season the function “OFF permit” can be active by means of the unit shut-down function

10. Comfortable supply air temperature

Where the supply air temperature drops below 16.5°C, the unit control automation records it as the minimum permissible supply air temperature and the message “critical supply temperature” is shown on the remote control. By activating this function it is possible to choose how long low temperature may be supplied before the message is shown.

Other information:

Function adjustment, setting:

Only by “FLEX” remote control (password required)

„Meniu“ > „Extra“ > “Service” > AF menu PassiveTC OFF/ON

Activation of the minimum supply air temperature (16,5 C) function (by default off”)

Menu > additional > Service>AF>PassiveTC
The duration of low outdoor temperature before the message is shown:
Menu > additional > Service>AF>Excercise
Off – only when the temperature drops to PassiveTC”

11. Night cooling

Night ventilation – room cooling by bringing in night-time air. It is normally on, where outdoor temperature in the daytime is >26°C, and in the night-time it is <16°C. In the night-time room temperature must be >17°C. Every 3 hours the unit switches on for 5 minutes: it measures the supply air and room temperature. If the room temperature becomes higher than the desired temperature 5 minutes later, and the outdoor temperature is lower than the set night-time outdoor temperature, the unit is on until the outdoor temperature starts exceeding the set night-time outdoor temperature OR the room is cooled down to the set temperature. Standard parameters can be changed in the service menu.

Function adjustment, setting:

Only by “FLEX” remote control (password required)

Menu>Additional>Service>NightCtrl.

“Night Control” – night cooling settings. The function will be on, where the outdoor temperature limit set by “day T” is exceeded for the operating unit, and outdoor temperature drops below
“NightT” and room temperature does not drop below “Room T” after the unit has been switched off.
- “day T” – {15-40}°C maximum outdoor temperature
- “Night T” – {0-15}°C minimum outdoor temperature
- “Room T” – {10-30}°C room temperature
- “Exercise” – {0-5} h. Purging and measuring take place regularly. If the setting is “0”, outdoor sensor must be routed outdoors.

12. Heat-cool recovery

Heat recovery takes place when air extracted from indoors is warmer than air extracted from outdoors and there is a demand to supply warm air. Cold recovery takes place when air extracted from indoors is colder than air extracted from outdoors and there is a demand to supply cold air.

13. Fast button, stand-by mode

Flex remote control has a so-called fast button whose function can be adjusted, if required. Possible functions: Standby mode and Maximum (“Boost”). Functions can be selected in the remote control settings. The unit is switched from the active “stand-by” mode to the energy saving mode. I.e. in this mode energy consumed by the unit does not exceed 1 W.

Operation:

If the “fast” button is configured to activate “stand-by” mode, the message “stand-by mode” will be shown on the remote control upon activating this mode.

Function adjustment, setting:

“Fast button” configuration (Only by “FLEX” remote control):
Menu>additional>Add.Func>Fast Butt.
• “Fast Butt.” – to choose the purpose of the fast button: “Standby” , or “boost/fireplace”

14. Filter timer

The unit service time till the filter clogging message is set. After the set time expiry the filter clogging message is shown on the remote control. In the remote control “FLEX” and “Stouch” you can track the filter timer readings and reset the timer.

Other information:

After filter replacement it is required to reset the filter timing. Filter clogging service time meter is activated in the service menu “Menu>additional>sevice>FMisc>Ftimer”.

Function adjustment, setting:

By “FLEX” remote control

Menu > Extra > filters
• “Set Timer” – service hours until the information message for filter replacement are set (designed time till the filter replacement is 2,160 service hours).
• “ReSet Timer” – resetting the meter
• “Curr.Timer” – current number of service hours
“Menu” > “Additional” > “Service” > Misc”
The unit shut-down conditions depending on the remote control connection
• “RC NC” – {On, Off} (default value “off”)
• On – (Remote Control) No remote control, the unit is shut down
• Off – (Remote Control) No remote control, the unit is on

This setting is not effective, if the unit is controlled through the ModBus interface. Where “RC NC” is “off”, the unit is shut down in 10 s.

• Filter timer activation.
• “F Timer” – {On, Off} (default value “On”)
• On – (Filters timer) filter clogging timer is on. In the main user’s menu the item “Filters” appears
• Off – (Filters timer) filter clogging timer is off

By “Stouch” remote control
In Item P.06 of the Stouch user’s menu you can review how many days passed after the filter replacement. If the element B6 at Item P.06 is held down for 5 seconds, the timer is reset.

No	Description	Possible values	Default value
P.06	Filter timer	0 – 999 days	0

When the time indicated by “STouch” remote control is over, the accident is shown “A.03”. When accident A.03 is cancelled, the filter timer is also automatically reset.

Where STouch remote control is used, all settings made by Flex remote control are no longer used. Filter timer is recorded in the Stouch remote control.

15. Boost/fireplace function

Upon activating: In the “Boost/fireplace” settings the supply fan speed max Pa and extract fan speed minPa must be indicated; time must be also set, e.g. 5 min (in the function “boost/fireplace”). The fireplace function is always active, if the unit operates according to the values measured by pressure transmitters. When supply air pressure drops (e.g. the supply air fan fails), the unit is switched off by 10 %.

To ensure proper functioning of the fireplace function it is REQUIRED to connect pressure transmitters (supply and extract air). If this function is to be used, pressure transmitter “1141” must be ordered.

16. Bypass damper and its control

The by-pass valve is controlled by heat-cold recovery and it is used to maintain heat together with the heat exchanger.

Operation:

To control the by-pass valve the three-position actuator is used, i.e. based on heat-cold recovery and PID controller the actuator proportionally opens/closes the valve depending on whether or not it is required to return warm or cooled down air. This way of control ensures the efficient use of the heat exchanger.

Other information:

The by-pass valve actuator is used in three-position 24VDC supply voltage. It is integrated in the ventilation unit.

Connection of the unit to electric network

- Supply voltage to the unit must be connected by a qualified specialist following the manufacturer’s instructions and effective safety instructions.
- The unit’s power network voltage must correspond to electrotechnical parameters of the unit indicated in the technical decal (~230V; 50 Hz).
- The unit’s voltage, power and other technical parameters are provided in the unit’s technical decal (on the unit casing). The unit must be connected to the voltage plug socket of the grounded power network in compliance with the effective requirements.
- The unit must be earthed according to the rules on installing electrical equipment.
- The start-up and operation of the unearthed ventilation unit is prohibited.
- It is prohibited to use extension wires (cables) and power network plug socket distribution devices.
- Prior to carrying out any ventilation unit installation and connection activities (until its hand-over to the customer), the unit must be disconnected from the power network.
- Prior to carrying out any ventilation unit maintenance activities, the unit must be disconnected from the power network.
- After installation of the ventilation unit, the power network plug socket must be accessible at any time and disconnection from the power network is performed through the two-pole circuit breaker (by disconnecting phase pole and neutral).
- The unit must be thoroughly checked against damages (execution, control, measurement nodes) during transportation before it is connected to the power network.
- The power cable can be replaced only by a qualified specialist upon the evaluation of the rated power and current.

The manufacturer does not assume any liability for personal injuries and property damage due to non-conformance with the provided instructions.

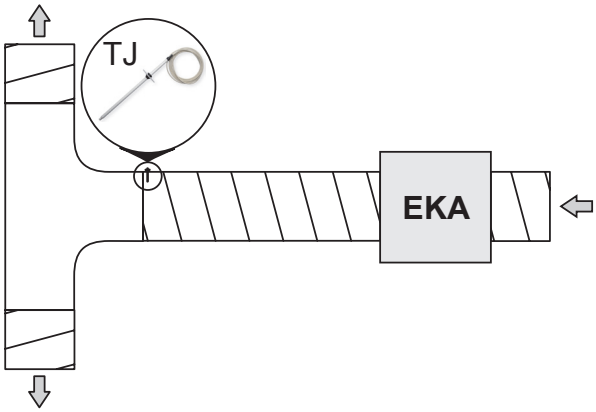
Recommendations for installation of functional modules (operational, control measurement)

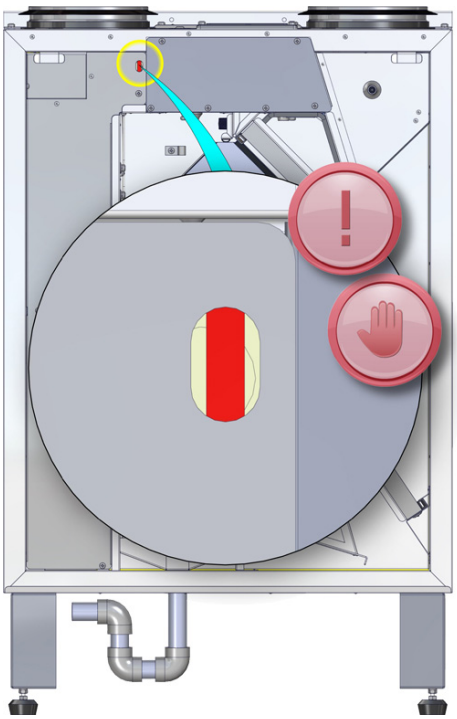
All measurement, control and execution devices must be installed in easy-to-access places for maintenance, repair or replacement.
Prior to the unit hand-over to the user, the pre-commissioning must be carried out so that the automatic control system of the ventilation unit operates properly.
The plug socket must be installed at a distance preventing the unit's power cable from stretching. The standard length of the unit's power cable is: ~ 2.5 m long from the unit casing.

The supply air sensor (SS) must be installed as far from the unit as the sensor cable enables or to the first branching, turn of the air transportation system. It is recommended to install supply air sensors as far from the heater (cooler) as possible in order to receive more accurate temperature measurement results.

Where the supply air heater is used, the supply air sensor (SS) must be installed downstream of the heater (or cooler), if the sensor cable long enough, or to the first branching, turn of the air transportation system.

Prior to connecting the unit to the power network, the door must be closed.





Forced pressing of the door switch by side tools is prohibited.

Rated current of the plug socket must not be lower than that of the unit indicated in the technical decal.

The unit must be connected to the power supply through the current leakage relay (30 mA).

Additional external functional nodes to be connected to terminal X16 must be connected after removing the automation plate (pull it until the plate leans against the fixation screw) and leaving the cable reserve (~ 10cm) for automation extension.

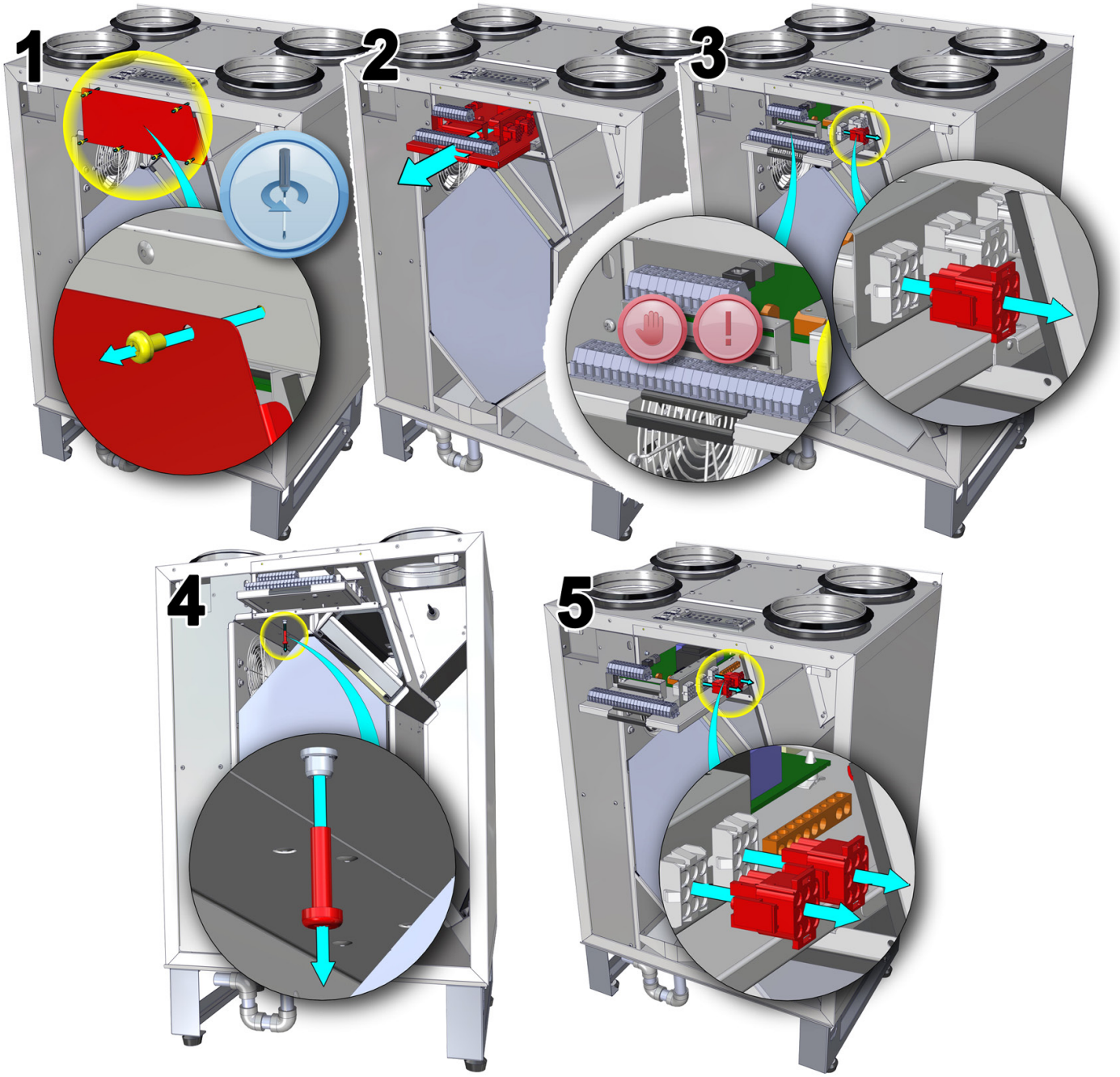
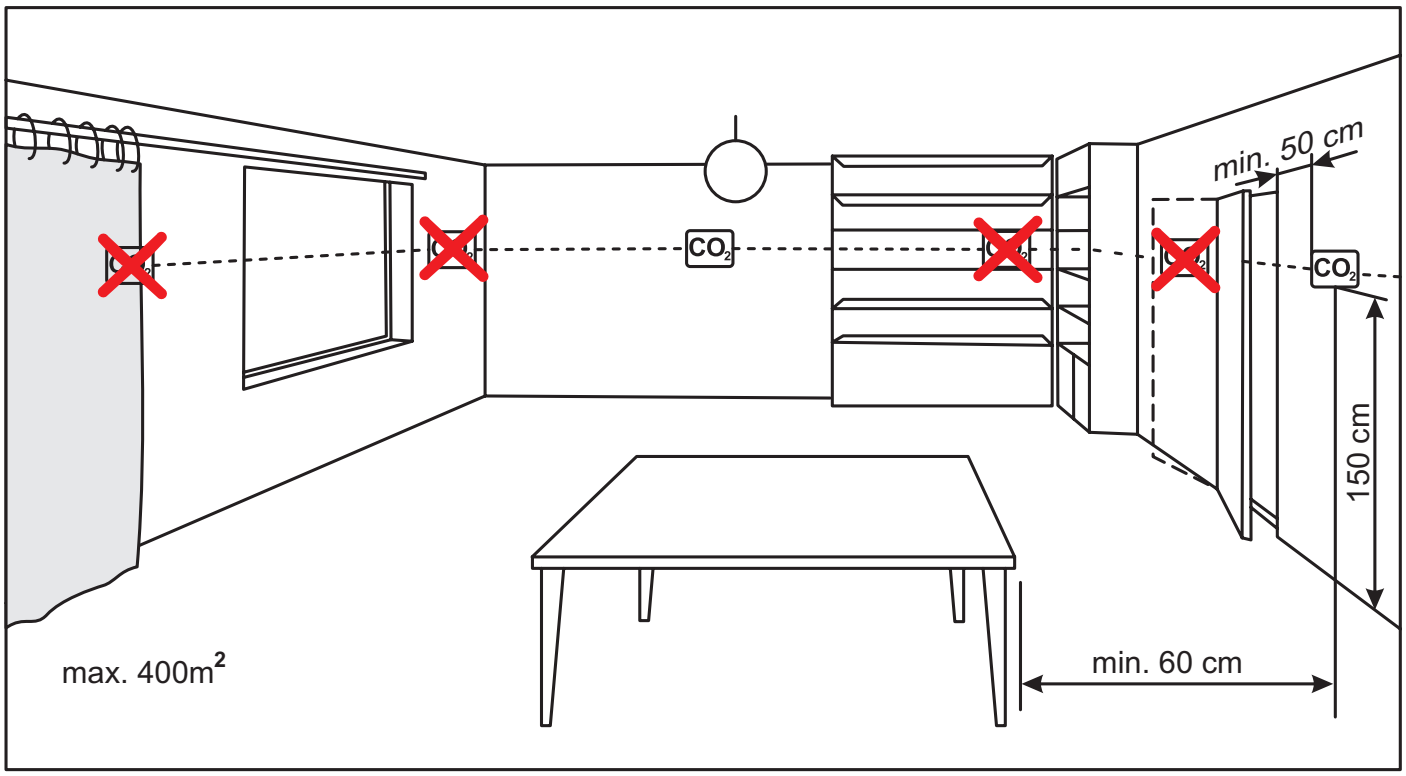


Fig. 4.5. When the unit control automation must be extended from the automation compartment, the limiting automation extension screw must be unscrewed and two connectors of the automation must be disconnected.
If external units are connected to X16, they must be also disconnected prior to extending automation.

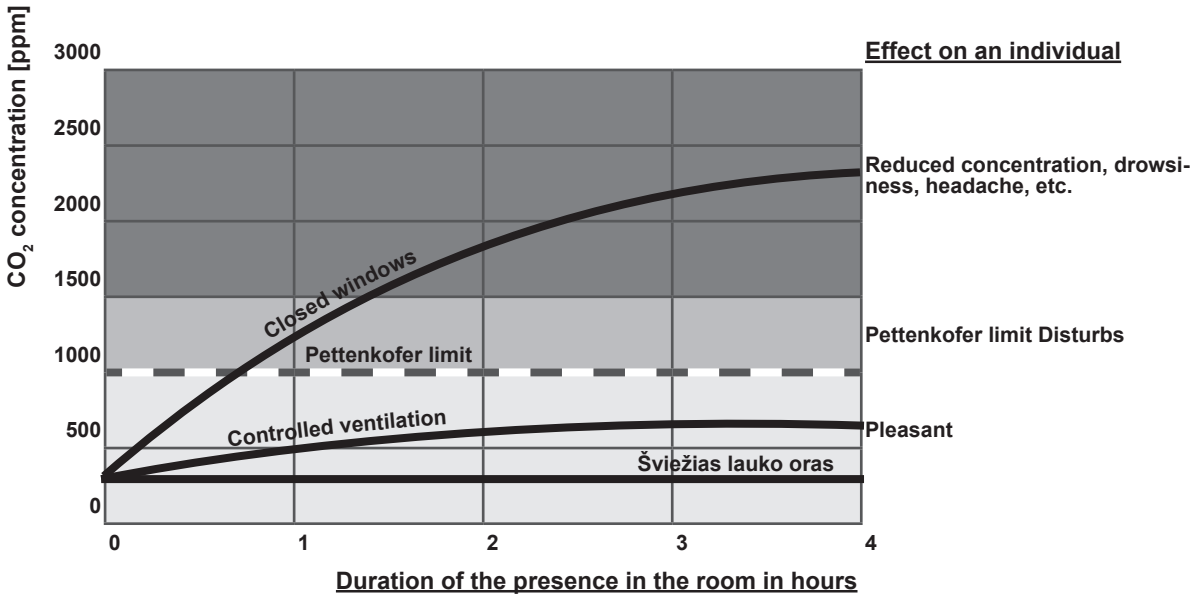
Upon the full dismantling of the unit control automation and its re-installation, make sure that the connector conductors are not damaged or otherwise broken prior to connecting automation connectors.

Room CO2 transmitter installation recommendation

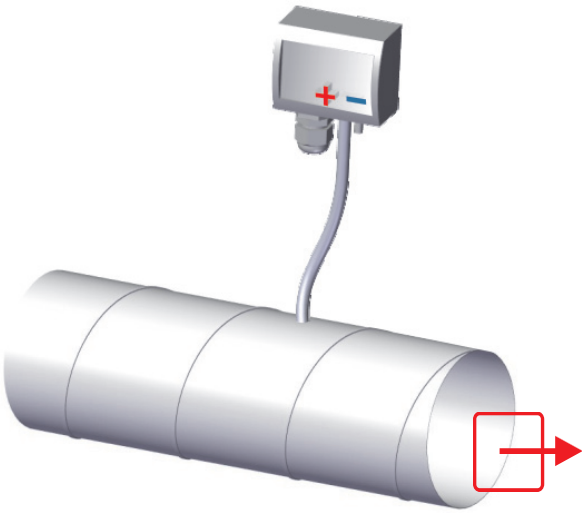


Where the channel CO2 transmitter is used: it must be installed in the extract air duct. Tool for drilling holes are required for its installation.

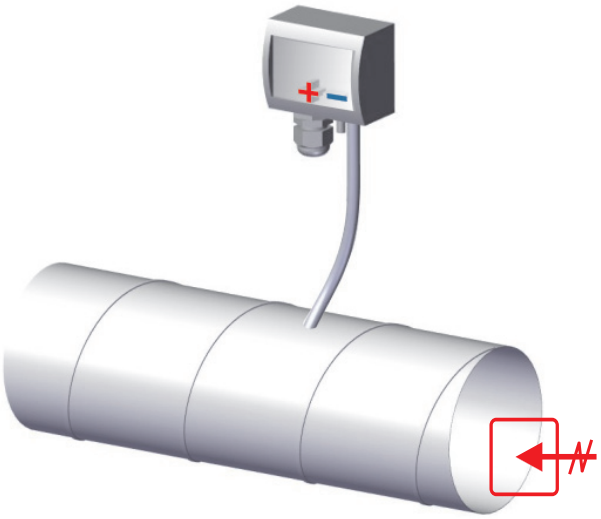
CO2 concentration according to Pettenkofer limit



Transmitter1 pressure



Transmitter2 pressure



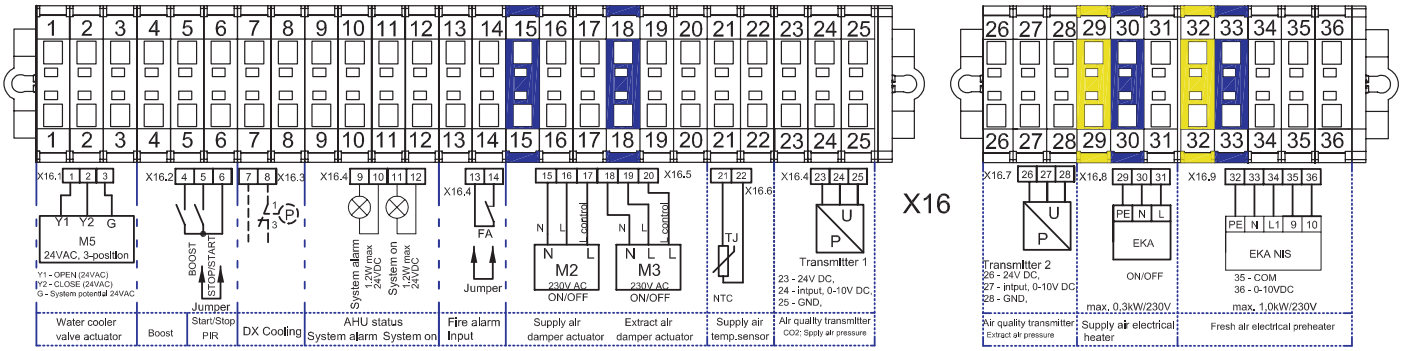
exhaust air
extract air
fresh air
supply air

Where the pressure transmitter is installed on the supply air transportation system, the hose must be plugged to “+”. Where the pressure transmitter is installed on the extract air transportation system, the hose must be plugged to “-”.

Connection of the unit’s external functional modules

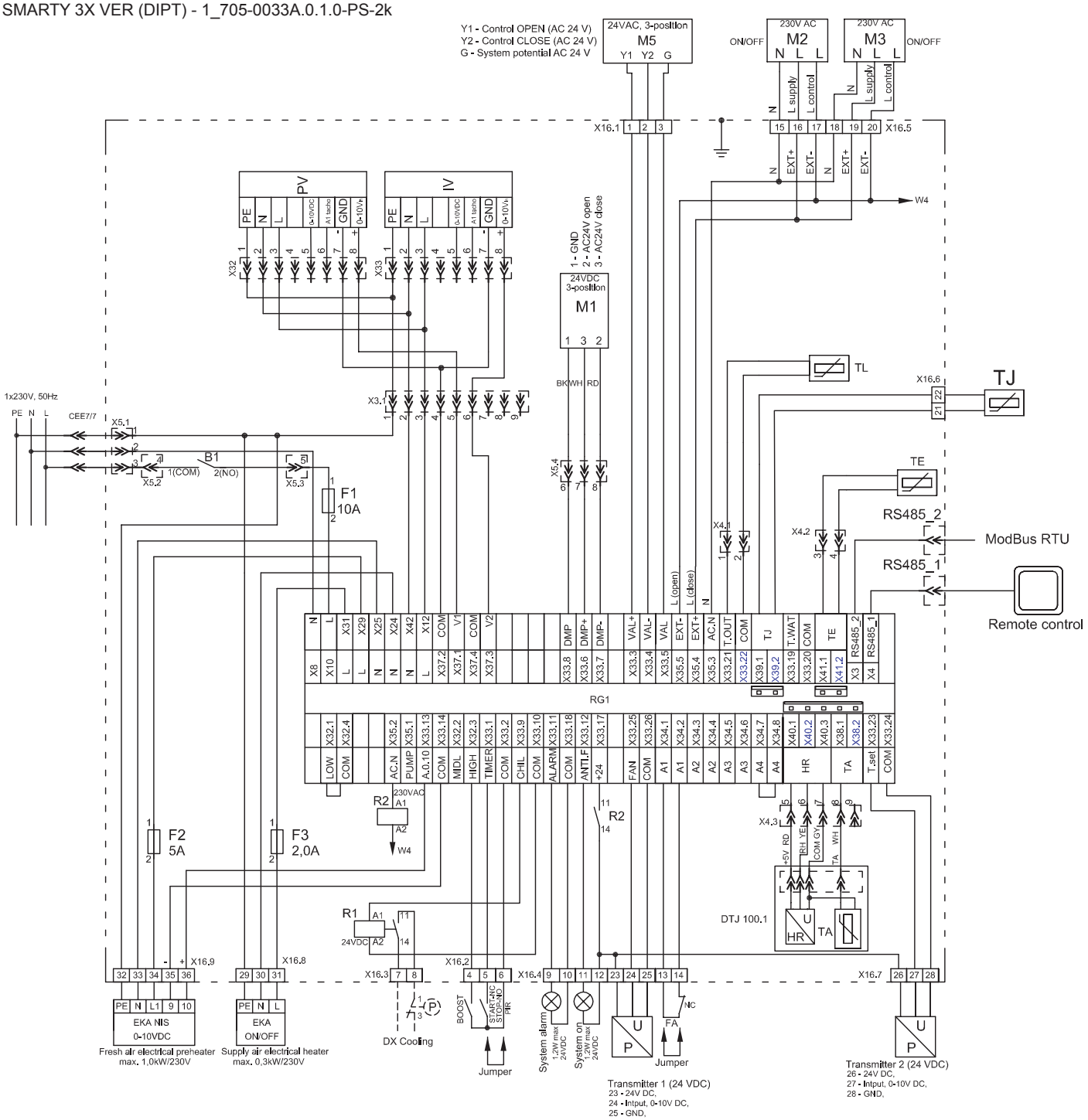
All external ancillary units are connected in the terminal block (X16)

IP2E-/1-36/EKA NIS/EKA/V2.3/R2-L-1k



Principle electrical connection diagram

SMARTY 3X VER (DIPT) - 1_705-0033A.0.1.0-PS-2k



M1	actuator of by-pass damper (just Smarty 3X)
M2	outside air damper actuator
M3	extract air damper actuator
M5	water cooler valve actuator
TL	temperature sensor for fresh air (TJK-10K)
TJ	temperature sensor for supply air (TJK-10K)
TE	exhaust air damper actuator (TJK-10K)
DTJ100.1	temp. and humidity sensor for extract air.
PV	supply air fan EC
IV	extract air fan EC
FA	fire alarm input
B1	units door micro switch

Trans-mitter	transmitter air quolity
P	Dx cooler protection differential pressure switch
PIR	motion sensor
S1	rotor heat exchanger speed sensor (tik Smarty 3R)
R	rotor heater exchanger actuator (tik Smarty 3R)
RG1	controller PRV_V2.3
F1, F2, F3	fuse
R1, R2	relay

System protection

The unit control automation has the built-in protection against short circuit:
• fresh air preheater protection (fuse)
• supply air heater protection (fuse)
• unit protection (fuse)
The built-in door end switch enables instantaneous (short-term) visual inspection of the unit and user's protection against rotating parts (if the unit door is accidentally opened). If it is activated, the unit is shut down.

To ensure safe maintenance of the unit, it is necessary to remove the plug from the power network or disconnect supply voltage by a two-pole circuit breaker. In which case, the additional protection of the circuit breaker against its accidental switch-on must be ensured.

Recommendations before the start of the unit (before the final user)

Prior to start-up the system must be thoroughly cleaned. Check whether:
• operation systems and unit elements as well as automation and automation devices were not damaged during installation,
• all consumers are connected to power supply and fit for service,
• all necessary automation elements are installed and connected to power supply and terminal block X16
• cable connection to terminal block X16 comply with the existing power connection diagrams,
• all electrical equipment protection elements are properly connected (if they are additionally used),
• cables and wires correspond to all applicable safety and functional requirements, diameters, etc.,
• earthing and protection systems are properly installed,
• condition of all seals and sealing surfaces is proper.

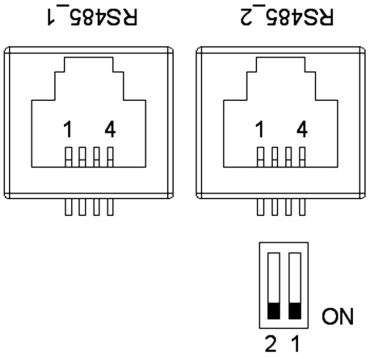
Using the unit in BMS network

The recuperator can be connected to the BMS network by using the ModBus protocol.The device can be controlled using FLEX panel and BMS network simultaneously: the device will work based on the latest changes of settings. As set in the factory, the device will operate (if no faults are present) based on the latest panel settings in case the panel or BMS network (or even both) is disconnected. This setting can be changed, please see Flex_meniu_montuotojas

section 14 "Misc" for details.
ModBus type: RTU
RS485_2 port is used for connecting the ModBus (Fig. 3);
Settings (see section II.6.2. of the FLEX installer description):

RS485_1 bei RS485_2. RS485_1 – remote control panel socked; RS485_2: Mod-Bus port

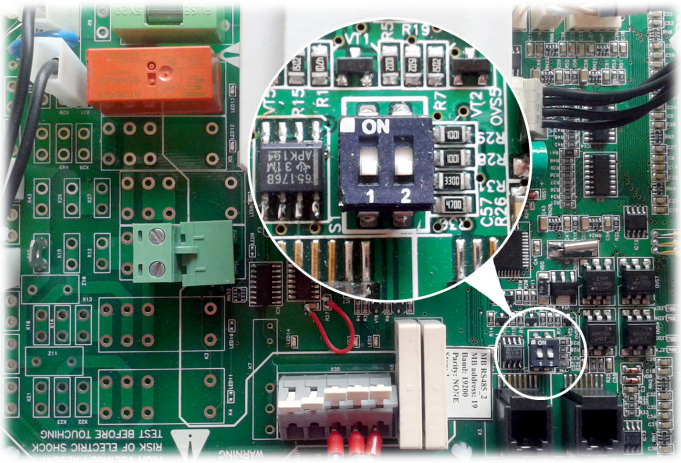
RJ11 lizdo kontaktų reikšmės:
1 – COM
2 – A
3 – I
4 – +24V



Microswitches 1 and 2 (Fig. 4) are mounted in the control board for selecting of resistances during network adjustment. Adjustment depends on the connection method. If the ring type connection is used, up to 30 units could be connected. If other method is used, approximately 7 units could be connected. The resistance between the fi fi rst and the last unit should be 120...150 Ω.

The remote control can be connected to and disconnected from the unit only after switching off the supply voltage of the unit.

Resistance Ω	Switch 1	Switch 2
180	ON	ON
470	ON	OFF
330	OFF	ON



Microswitches 1 and 2

ModBus addresses

	Name	ModBus func.	Data address	Quantity of data	Description	Values
1	Antifrost	01h_Read_Coils	0	1	Plate heat exchanger frost protection function	1-active, o-passive
2	Fire	01h_Read_Coils	1	1	Fire alarm	1-active, o-passive
3	Filter	01h_Read_Coils	2	1	Dirty filter alarm	1-active, o-passive
4	Fan	01h_Read_Coils	3	1	Fans alarm	1-active, o-passive
5	LowPower	01h_Read_Coils	5	1	Low voltage	1-active, o-passive
6	Textract	01h_Read_Coils	6	1	DTJ(100) temperature sensor alarm	1-active, o-passive
7	Texhaust	01h_Read_Coils	7	1	Exhaust air temperature sensor alarm	1-active, o-passive
8	Tlimit	01h_Read_Coils	8	1	Supply air temperature sensor alarm	1-active, o-passive
9	RH	01h_Read_Coils	9	1	DTJ(100) humidity sensor alarm (controller works in determining themoisture content of 70%)	1-active, o-passive
10	ReturnWater	01h_Read_Coils	10	1	Return water temperature sensor alarm	1-active, o-passive
11	ToutDoor	01h_Read_Coils	11	1	Outside air temperature sensor alarm (controller continues to work in determining ToutDoor<0C)	1-active, o-passive
12	MotorActive	01h_Read_Coils	13	1	Fans ON	1-active, o-passive
13	InDumpper	04h_Read_Input	14	1	Outside air damper actuator	0-90
14	Preheater	01h_Read_Coils	12	1	Preheater indication	1-active, o-passive
15	Heater	01h_Read_Coils	14	1	Heater indication	1-active, o-passive
16	Speed	06h_Write_Holding_Register	0	1	Fans speed settings	0, 1, 2, 3
17	TsetPoint	06h_Write_Holding_Register	1	1	Supply air temperature set	0-30
18	RH_value	04h_Read_Input	13	1	DTJ(100) humidity sensor value	0-99
19	Motor1	04h_Read_Input	15	1	Motor1 fan speed value	0-3
20	Motor2	04h_Read_Input	16	1	Motor2 fan speed value	0-3
Temperature sensor value real format (-3.3E38 - 3.3E38) example: 0h->0C, 7FFFh->3276.7C, 8000h->3276.8, FFFFh->-0.1C						
21	Tlimit	04h_Read_Input	0	1	Supply air temperature value	Real (value*10)
22	Texhaust	04h_Read_Input	6	1	DTJ(100) temperature sensor value	Real (value*10)
23	Textract	04h_Read_Input	3	1	Exhaust air temperature sensor value	Real (value*10)
24	ToutDoor	04h_Read_Input	9	1	Ouside air temperature sensor value	Real (value*10)
25	Twater	04h_Read_Input	12	1	Return water temperature sensor value	Real (value*10)

Basic failures of the HVAC unit and troubleshooting

Failure	Cause	Explanation / corrective actions
Unit is not operating	No supply voltages	Check if the plug is connected to the plug socket
	Two-pole protection device is off or a current leakage relay is active (if installed by the installer)	Switch on only if the unit condition has been evaluated by a qualified electrician. If the system failed, the failure MUST BE rectified prior to switching it on.
	Unit door is not properly closed	Visually inspect whether the door properly presses the end switch
Air supply heater or preheater is not operating or malfunctioning (if installed)	Too low air flow in air ducts activates automatic protection	Check if air filters are not clogged Check if fans are rotating
	Manual protection is activated	Possible heater or unit failure. MUST address the servicing staff for failure detection and its elimination.

Too low air flow at rated fan speed	Clogged supply and/or extract air filter(s)	Filter replacement needed
Filters are clogged and no message is shown on the remote control	Wrong time in filter timers	Shorten filter timer time till the message of clogged filters
“FLEX” remote control shows the message – “Wrong Psi	Wrong adjustment of the air transportation system	Address the servicing staff for the system adjustment

Service manual of “FLEX” control panel

“Menu” → “Extra” → “Service” additional settings from the controlled recuperator, enter the password 4444.
1. „Menu configuration“ - configuration of the main menu. (Only from V2.3 controller version and description under paragraph 17.1 the selected value -”VerX.3“)
1.1. „OFF permission“ – possibility to stop the unit.
1.1.1. „OFF time“ - {24h - 0h} for what period of time it is possible to turn the unit off according to a chosen season.
24h – unlimited turn off time, items „OFF season“ and „Seasons“ are not used.
Xh – it is possible to turn off for a selected number of hours a day during a selected season.
Selecting the mode “OFF” backward clock displays when the unit will turn on.
0h – impossible to turn off during a chosen the season.
1.1.2. „OFF season“ - {summer, winter, Always}which season of the year can unit‘s turn off „OFF permission“ function.
1.2. „Seasons“
1.2.1. „Switch season“ - choose according to what the seasons are changing.
3 days mean – according to 3 days average outdoor air temperature, selection in paragraph 1.2.2.
Calendar – according to a chosen date, selection in paragraph 1.2.2.
summer – manual turn on of summer season turn on.
winter – manual turn on of winter season turn on.
1.2.2. „Settings“ – winter/summer time settings
„Outdoor air temp.“ – (0-20°C) outdoor temperature is set to calculate 3 days average, if the outside air temperature falls below the set value during the course of three days, „OFF permission“ function is allowed.
„summer“ – summer season beginning date when „Calendar“ is chosen.
„winter“ – winter season beginning date when „Calendar“ is chosen.
2. „PI“ - PI coefficients of the entire system which define the response to heating or cooling.
2.1. „Kp“ - {1-1000}
2.2. „Ki“ - {1-10000}
3. „Room PI“ - coefficients for work based on the extracted air.
3.1. „Kp“ - {1-1000}
3.2. „Ki“ - {1-10000}
4. „HeaPI“ - electric heating coefficients
4.1. „Kp“ - {1-1000}
4.2. „Ki“ - {1-10000}
5. „Byp/RotPI“ - coefficients of the bypass valves or rotor
5.1. „Kp“ - {1-1000}
5.2. „Ki“ - {1-10000}
6. „ChilPI“ - coefficients of the cooler
6.1. „Kp“ - {1-1000}
6.2. „Ki“ - {1-10000}
7. „PreHeatPI“ - coefficients of the preheater
7.1. „Kp“ - {1-1000}
7.2. „Ki“ - {1-10000}
8. „NightCtrl“ - night cooling settings. Function will be active when the set outdoor air temperature limit „day T“ is exceeded for the working unit, and when temperature drops below „Night T“ and the room temperature stays above „Room T“ after switching the unit off.
8.1. „Day T“ - {15-40}°C maximum outdoor air temperature
8.2. „Night T“ - {0-15}°C minimum outdoor air temperature
8.3. „Room T“ - {10-30}°C indoor air temperature
8.4. „Exercise“- {0-5} h. Period for blowing, measuring. If the setting is “0”, outdoor air sensor should be placed outdoors.
9. „Wheat“ - temperature settings of the water heater.
9.1. „W_crit“ - {„Watter stop“+5, 20}°C The limit from which the temperature of the return water is forced to be increased.
9.2.„W_stop“ - {-10 „Watter crit“-5}°C The limit at which fans are stopped.
9.3. „Pump_stop“ - {10-30}min. Time after which the water pump is switched off if there is no need for heating.
9.4. „Exercise“ - {0-5}h. The period for preventive start of the water pump „Pump_stop“ time.
10. „Act“ - select the basic settings of the unit.

NOTICE! Leaving this paragraph the unit and the controller reloads.

10.1. „Heater“ - {E_On/Off, E_0_10, E_ESKM, W_VAL+-, W_0_10}
E_On/Off - the electric heater is On/Off controlled using the relay
E_0_10- the electric heater is controlled using 0–10 V output
E_ESKM- TRIAC control of the electric heater
W_VAL+- - Control of the three-position actuator of the water heater
W_0_10 - Control of the 0–10 V actuator of the water heater
10.2. „Exch“ - {R_0_10, R_On/Off, B_0_10, B_DMP}
R_0_10- 0–10V control of the rotor heat exchanger
R_On/Off - On/Off control of the rotor heat exchanger using the relay
B_0_10- 0–10 V control of the bypass valve of the plate hater exchanger
B_DMP- Control of the three-position bypass valve of the plate heat exchanger
10.3. „VentUnit“ - {TK, RHEC, RHC}
TK- Supply chamber, paragraph 10.2 is not applicable

RHEC- Recuperator with the heat exchanger control
RHC- Recuperator without the heat exchanger control
10.4. „Fans Tipe“ - {EC_0_100, EC, AC}
EC_0_100
EC- control of the EC motors using 0–10 V signal
AC- control of the AC motors using three fixed voltages
11. „PSI.“ - when pressure support is selected, min. and max. limits are set for the pressure converter
11.1. „min_0V“ - {0ppm-2000} %, Pa
11.2. „max_10V“- {0ppm-2000} %, Pa
12. „CO2“ - when CO2 control is selected, min. and max. limits are set for the CO2 converter
12.1. „min_0V“ - {0ppm-2000} %, ppm
12.2. „max_10V“- {0ppm-2000} %, ppm
12.3. „PPM_100%“ - {20-255}*100ppm
13. „VentCtrl“ - setting of the indications for fans
13.1. „SAF“ - {Percent, Pressure} settings for the indications of the supply air motor %, Pa.
13.2. „EAF“ - {Percent, Pressure, SAF+Percent} settings for the indications of the extracted air motor %, Pa
SAF+Percent – the alteration of the extracted motor can change only at set value according to the supply.
13.3. „CO2“- {On/Off} extracted air CO2 sensor
13.4. „ResetToFactorySettings“ - after switching “OK”, factory settings are saved.

NOTICE! The unit and the controller reloads.

14. „Misc“ - stop conditions for the unit depending on the connection of the controller
14.1. „RC NC“ - {On, Off}
On – (Remote Control) No controller, the unit is stopped
Off – (Remote Control) No controller, the unit is on
This setting is not applicable if the unit is controlled via ModBus interface.
14.2. „F Timer“ - {On, Off}
On – (Filters timer) filter contamination timer on. Item „Filters“ appears on the main menu of the user.
Off – (Filters timer) filter contamination timer off.
14.3. „AX“ - {0, 1}
0 – overheat protection NC
1 – contactor malfunction protection indication
14.4. „Fans On“ - {On, Off}
On –in case of „AX“ protection, fans work at maximum speed.
15. „AF“ - anti-frost security settings
15.1. „AF detect“- {Off, DewP/PlateT, Toutside, Tesetpoint, Klingb, Heatex}for choosing anti-frost security algorithm type.
DewP/PlateT – according to the dew point and the heat exchanger wall temperature calculation algorithm
Toutside – according to outdoor sensor (DIBT)
TEsetpoint – according to exhaust air sensor
Klingb – according to Klinberger (hexagon) heat exchanger anti-frost diagram.
Heatex – according to Heatex (quadrangular) heat exchanger anti-frost diagram.
15.2. „FanReduc.“ - {On, Off} supply fan speed deceleration
On –allowed
Off – forbidden
15.3. „Bypp/Rot“- {On, Off}on activation of anti-frost protection.
On –possible to open the bypass valve o to stop the rotor.
Off –impossible to open bypass valve or stop the rotor.
15.4. „PassiveTC“ - {Off, 16,5°C}alarm report supplying low temperature air according to time set in 15.5.
15.5. „Excercise“ - {Off, 1-12h}how much time it is possible to supply low temperature air till the alarm report.
Off – only when temperature falls till „PassiveTC“ (see.:15.4).
16. „AF1“ –Anti-frost protection settings
Selecting 15.1. „AF detect“ - „DewP/PlateT“
16.1. „PlateTemp“ - 1°C – {-5 +10 °C}heat exchanger humidity temperature
Selecting 15.1. „AF detect“ - „Toutside“
16.1. „OutDoorTemp“ -
Selecting 15.1. „AF detect“ - „Tesetpoint“
16.1. „ExhaustTemp“ - {-20 +15 °C}when exhaust air temperature falls below the set value - anti-frost protection starts according to exhaust air temperature.
16.2. „RotorPWM“ – rotor impulse width modulation percentage.
16.3. „DefrStpTime“ – rotor standing/defrosting time in minutes.
16.4. „PassiveTemp“ – outdoor air temperature value, in case of exceeding which, anti-frost function is allowed.
17. „CONF1“ - (only from V2.3 controllers‘ versions)
17.1. „CONF1“ - {„Ver X.2“, “Ver X.3“}
“Ver X.3“ – for turning on „DIBT“ and „Passive house“ functions.
It is possible to choose „Building protection“ unit‘s working mode,
No speed choice „Stop“, (at „Schedules“ as well)
Necessary to set „Menu“ → „Extra“ → “Service” → “Menu configuration”
Necessary to set „Menu“ → „Menu configuration“ → „Economic temper.“
17,2 „3dayRH mean“ –for setting three-day humidity average %
17,3 „3dayRHCurr“ – three-day average of humidity %
17,4 „3dayOUTCurr“ - three-day average of outdoor air °C
17.5. „St/Sp time“ - External timer delay time for unit‘s switch to another mode.
18. „CONF2“ - (for controllers with V2.4.1. and higher)
18.1. „Old RC compatib“ - {*On“, „Off“} – compatibility with older remote controllers.
„On“ – the controller works with UNI, PRO, TPC and FLEX remote controllers but doesn‘t support extended ModBus address list.
„Off“ – controller works with FLEX remote controller and supports extended ModBus address list.
18.2. „empty1“ - unused
18.3.„empty2“ - unused
18.4. „empty3“ - unused
18.5.„empty4“ - unused

EN Air quality parameters control based on the CO2 converter.

1. Connect 0-10V control signal wire of the CO2 converter to the analog input T.SET of the control board (X16 „transmitter2“). Converter power supply (24VDC) wire is connected to the board output +24 and neutral (0V) wire to the COM contact (X16 „transmitter2“).
2. Configure the control board using the FLEX panel:
2.1. On the panel, select Menu → Additional → Service (enter password 4444) → Vent. Control. Change the value of the parameter „CO2“ to „On“.
2.2. On the panel, select Menu → Additional → Service → CO2. In accordance with parameters of the CO2 converter, select the CO2 level (using ppm units), which will be indicated at 0V threshold (parameter min_0V), and the level, which will be indicated at 10V (parameter max_10V).
2.3. On the panel, select Menu → Additional → Service → CO2. Select the level above which, when allowable level of CO2 is exceeded, the fans will operate at maximum speed (parameter PPM_100%).
2.4. On the panel, select Menu → Additional → Add.Func. Set the maximum allowable level of CO2 above which the supply air flow is increased (parameter CO2).
3. On the panel, in the menu Sensor overview you can see instantaneous exhaust CO2 value.
4. When allowable set CO2 level is exceeded, the information message High CO2 level is displayed at the initial screen and the speed of fans is increased based on the amount at which allowable level is exceeded.
5. In case of any fault of the CO2 converter, menu Emergency overview shows message CO2 sensor. Check if CO2 converter is properly connected (only current input).

The whole control system can be reset to its default values (factory settings) in the service menu (only by “FLEX” remote control) Password required:
“Menu” > “Additional” > “Service” > “Vent. Control” > “ResetToFactorySettings”
Press “OK”.

When this item is activated, all settings in the service and user’s environments are restored, except for the schedule.

Usage of “FLEX” test control panel

When using this remote control it is possible to activate functional nodes individually by selecting a relevant item.

Prior to activating the supply air heater or preheater, it is REQUIRED to switch on the supply air fan. All function, except for EC1 and EC2, are activated and deactivated by pressing the button “OK”.

“FLEX” test control panel menu structure

Report slave ID	EC1 (V1)	%
Test	EC2 (V2)	%
Extra	Bypass 0-10	%
	Cooling	▶√
	Heating	▶√
	Rot.-Bypass	▶√
	Fan Run	▶√
	Fan Fail	▶√
	Extern. Fan	▶√
	Pump	▶√
	Outs. Damper	▶√
	Extr. Damper	▶√
	Preheater	▶√
	Rotor fail	√
	Overheat	√
	Motor overheat	√
	Exchanger	√
	A3 Filter	√
	Extern. Off	√
	Fire input	√
	Extract humidity	
	Supply air temp.	
	Extract air temp.	
	Outdoor air temp.	
	Exhaust air temp.	
	Water temperature	
	Extract CO2	
	External alarm	√

To switch on supply and/or extract air fans the item “Extern.Fan” must be activated which activates the fan power circuit relay.

Tested items	Activated output (in the controller)	Activated output (in the controller)	LED
EC1 (V1)	V1-COM	Supply air fan speed (in percentage) is selected .	-
EC2 (V2)	V2-COM	Extract air fan speed (in percentage) is selected	-
Bypass 0-10	-	Not used	-
Cooling	X16-4, X16-8	NO contact closed (non-voltage).	-
	X16-1, X16-3	Activated by remote control "V"	LED4 (atidaroma)
	X16-2, X16-3	Deactivated by remote control	LED5 (uždaroma)
Heating	X16-30, X16-31	Supply air electrical heater. Relay K6	LED13
Rot.-Bypass	-	Damper opened, heat exchanger closed.	LED6 (atidaroma) LED7 (uždaroma)
Fan Run (System On)	X16-11 ir X16-12.		-
FanFail (System Alarm)	X16-9, X16-10		-

Extern. Fan		Supply and extract air fan relay speed activation.	LED8
Pump	-	Not used	-
Outs. Damper	EXT+ ir EXT-	Damper opening	LED2+LED3
Extr. Damper	EXT+	Damper closing	LED3
Preheater	X16-34	Preheater activation.	LED12
Rotor fail	-	Rotor failure imitation (under real conditions where rotor PID is 100%, then rotor error is indicated in 120 s. Where it is lower than 100%, the time is recalculated, rotor failure is shown on the remote control.)	
Overheat		LOW-COM short circuiter. Remote control shows “V”	
Motor overheat	-	Not used	
Exchanger	-	Not used	
A3 Filter	-	Not used	
Extern. Off			
Fire input	A1-A1	Fire alarm activation.	
Extract humidity	X40	Extract air humidity sensor readings	
Supply air temp.	X39	Supply air temperature sensor failure	
Extract air temp.	X38	Extract air temperature sensor readings	
Outdoor air temp.		Extract air temperature sensor readings	
Exhaust air temp.		Outdoor temperature sensor readings	
Water temperature	-	Exhaust air temperature sensor readings	
Extract CO2	-	Not used	
External alarm		CO2 transmitter readings	

V2.4.3 programos koeficientai

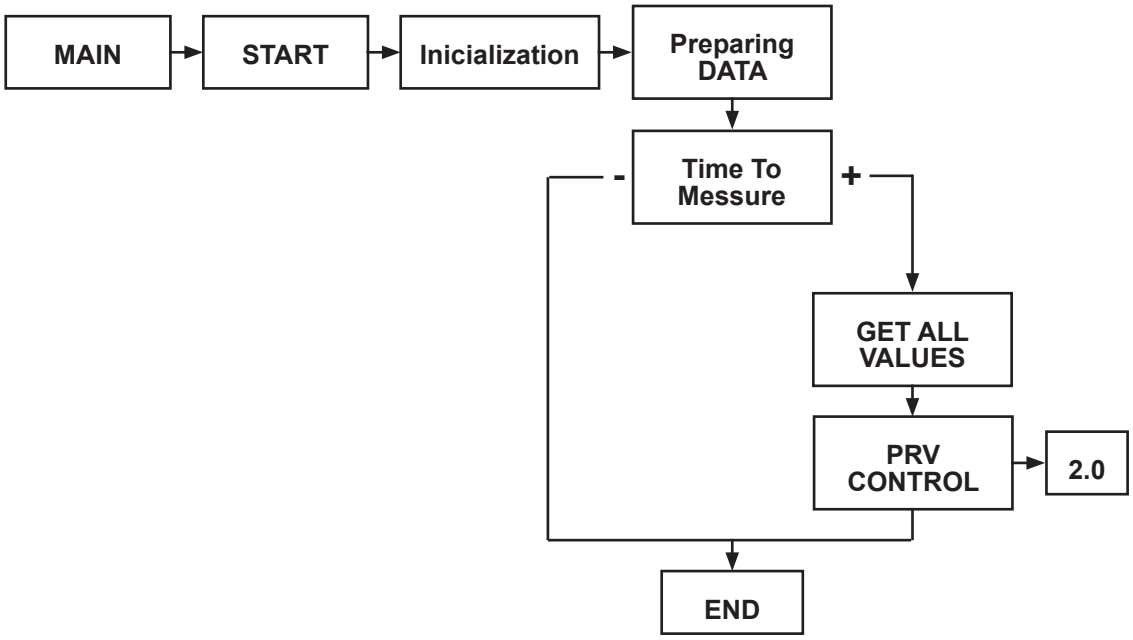
V2.4.3 programos koeficientai						
Programa				**SMARTY 3XVE-V2.3-2k**		
	Extra					
		Modbus	**MBAddress**	**1**		
			Parity	**None**		
			Baudrate	**4800**		
			Stop	**1**		
		Vent.Ctrl.				
			Mode	**Supply**		
			Min Supply	**..**		
			Max Supply	**..**		
			OutDoor T.C.	**..**		
		Cool. Ctrl.				
			Min Supply	**6 ºC**		
			DX_CoolOn	**23 %**		
			DX_CoolOff	**20 %**		
			OutDoor T.C.	**12 ºC**		
		Add. Func.				
			Night Cool.	**Off**		
			CO2	**..**		
			Fast Butt.	**standby**		
			FanStopTime	**60s**		
		Boost Ctrl.				
			Boost timer	**0 min**		
			Boost SAF	**130 %**		
			Boost EAF	**130 %**		

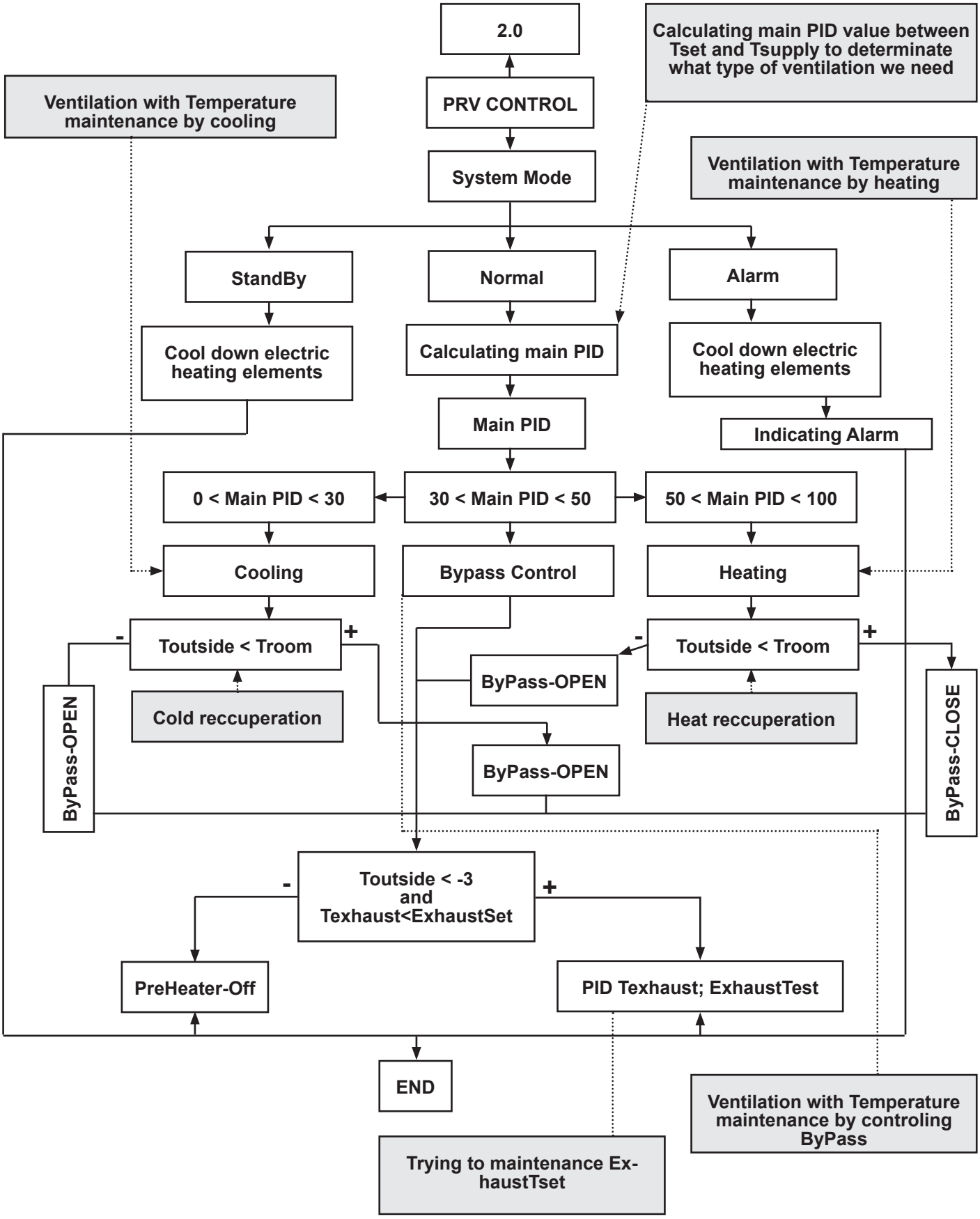
		SAF Ctrl.				
			SAF Low	31 %		
			SAF Midd	45 %		
			SAF High	74 %		
		EAF Ctrl.				
			EAF %	0 %		
SERVICE						
	Menu Configuation					
		Exit				
		OFF permission	Exit			
			OFF time	Always	0	
			OFF season	Never	Always	
		Seasons	Exit			
			Switch season	Exit		
				3 days mean	v	
				Calendar		
				Summer		
				Winter		
			Settings	Exit		
				Outdor air temp.	0 C	
				Summer	4MM	1DD
				Winter	11MM	1DD
	PI					
		Kp	10			
		Ki	8			
	RoomPI					
		Kp	100			
		Ki	10			
	HeatPI					
		Kp	30			
		Ki	10			
	ChilPI					
		Kp	10			
		Ki	10			
	PreHeatPI					
		Kp	40			
		Ki	10			
	NightCtrl					
		Day T	26 °C			
		Night T	16 °C			
		Room T	17 °C			
		Exercise	3 h			
	Wheat					
		W_crit	10 °C			
		W_stop	5 °C			
		Pump_stop	10 min			
		Exercise	10 h			
	Act					
		Heater	E_On/OFF			
		Exch	B_DMP			
		VentUnit	RHEC			

		FanType	EC			
	Psi					
		min_0V	0 Pa			
		max_10V	330 Pa			
	CO2					
		min_0V	0 ppm			
		max_10V	1000 ppm			
		PPM_100%	100 ppm			
	VentCtrl					
		SAF	Percent			
		EAF	Percent			
		CO2	Off			
		ResetToFactory setting				
	Misc					
		RC_NC	Off			
		F Timer	On			
		AX	1			
		FansOn	On			
	AF					
		AF detect	Toutside			
		FanReduct.	Off			
		Bypp/Rot	Off			
		PassiveTC	Off			
		Exercise	..			
	AF 1					
		OutDoorTemp	1			
		RotorPWM	20			
		DefrStpTime	30			
		PassiveTemp	-3			
	CONF1					
		3dayRH mean	30			
		3dayRHCurr	54			
		3dayOUTCurr	10			
		St/Sp time	0			
	CONF2					
		DIBTmenu	On			
		0	0			
		1	0			
		2	0			
		3	0			
	Filters					
		SetTimer	2160 h			
		ReSetTimer	reset			
		Curr. Timer	2 h			

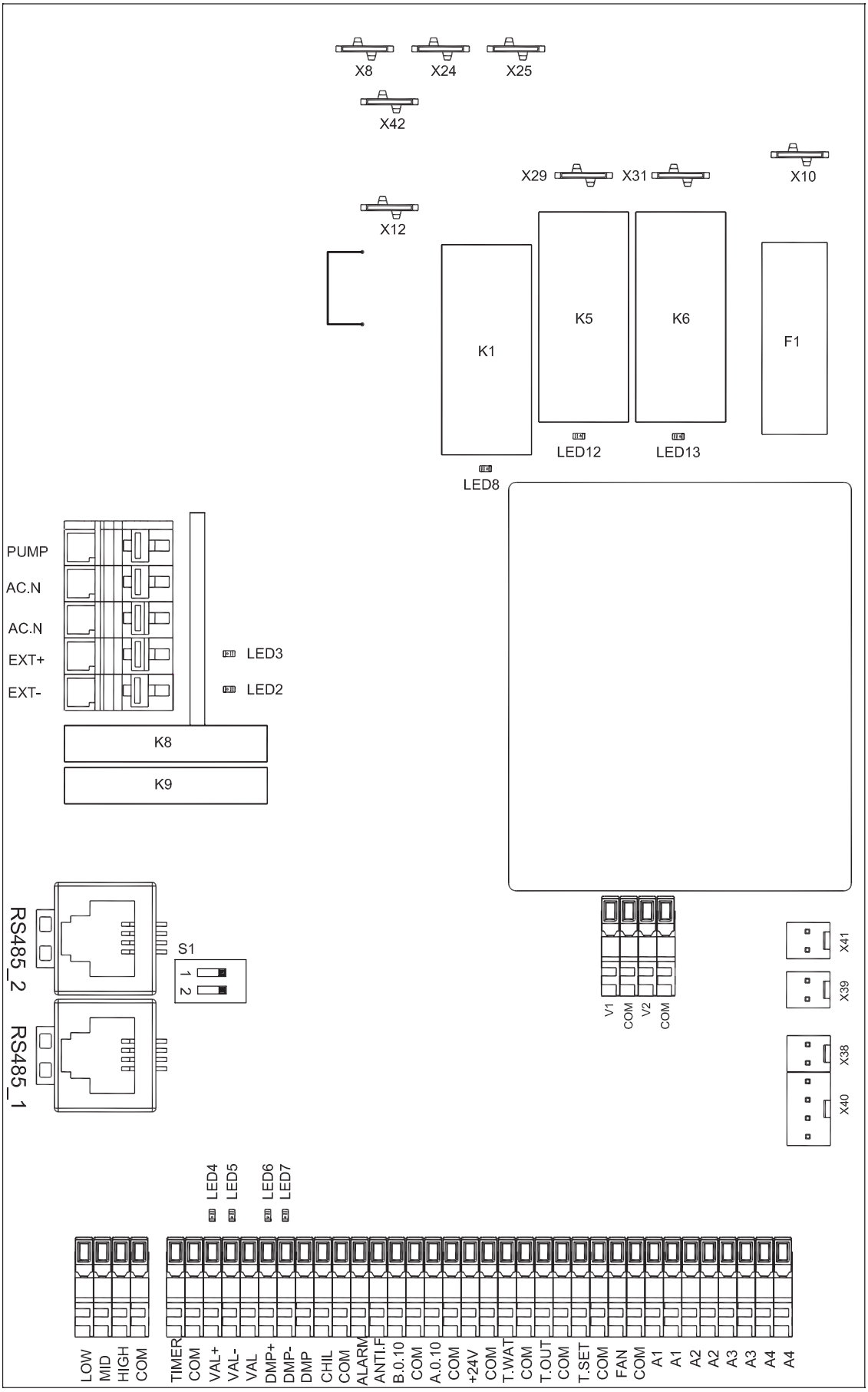
SAF Low		55%
SAF Normal		70%
SAF High		100%

Functional scheme of the unit's algorithm




2.0
Calculating main PID value between Tset and Tsupply to determinate what type of ventilation we need
Ventilation with Temperature maintenance by cooling
PRV CONTROL
System Mode
Ventilation with Temperature maintenance by heating
StandBy
Normal
Alarm
Cool down electric heating elements
Calculating main PID
Cool down electric heating elements
Main PID
Indicating Alarm
0 < Main PID < 30
30 < Main PID < 50
50 < Main PID < 100
Cooling
Bypass Control
Heating
-
Toutside < Troom
+
-
Toutside < Troom
+
ByPass-OPEN
Cold reccuperation
ByPass-OPEN
Heat reccuperation
ByPass-OPEN
ByPass-CLOSE
-
Toutside < -3 and Texhaust<ExhaustSet
+
PreHeater-Off
PID Texhaust; ExhaustTest
END
Ventilation with Temperature maintenance by controling ByPass
Trying to maintenance Ex-haustTset

Controller's indication



LED2	air valves opened
LED3	(together with LED2) – air valves opened
LED4	damper opened (water cooler)
LED5	damper closed (water cooler)
LED6	by-pass damper opened
LED7	by-pass damper closed
LED8	EC motor switch-on
LED12	electrical preheater/rotor is on (only Smarty 3R)
LED13	electrical preheater is on

Sensors and their technical parameters

Sensors TJK-10K (TJ,TE,TL)
Thermistor NTC10K (10k prie 25°C; ß=3250÷3300K).
Temperature measurement limits -30..105°C.
Accuracy – ±1%;
Safety class – IP20

Relative humidity transmitter (DTJ100.1)
DTJ100.1 Relative humidity transmitter has a built-in NTC10K temperature sensor (TA) (ß=3250÷3300K).
Relative humidity transmitter supply voltage – +5VDC
Used current – not higher than 5 mA
Output – analogue (V DC)
Measurement limits – 20.....95%(RH)
Accuracy – +-5%.
Safety class – IP20.
Dimensions (IxPxA) – 63x38x15 mm.
Voltage (V) and relative humidity (RH) dependence:

0,6V - 20%RH ;
0,9V - 30%RH ;
1,2V - 40%RH ;
1,5V - 50%RH ;
1,8V - 60%RH ;
2,1V - 70%RH ;
2,4V - 80%RH ;
2,7V - 90%RH ;
2,85V – 95%RH;

DTJ100.1 cable colour marking and the meaning
(1) Grey/black – general (GND).
(2) Yellow/orange – humidity sensor output (RH).
(3) Red – supply voltage (+5V).
(4) Not used.
(5) White – temperature sensor output (T A)

Declaration of Conformity

Manufacturer

UAB "SALDA"
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LT-78109 Šiauliai, Lithuania
Tel.: +370 41 540415
www.salda.lt

Hereby confirms that the following products - Air handling units:

SMARTY 3*

(where by „*" indicates possible unit installation type and modification)

Provided it was delivered and installed in the facility in accordance with the included installation instructions, comply with all applicable requirements in the following directives:

Machinery Directive 2006/42/EC
Low Voltage Directive 2006/95/EC
EMC Directive 2014/30/EU

The following harmonized standards are applied in applicable parts:

LST EN ISO 12100 - Safety of machinery - General principles for design - Risk assessment and risk reduction.
LST EN 60204-1 - Safety of machinery - Electrical equipment of machines - Part 1: General requirements.
LST EN 60335-1 - Household and similar electrical appliances. Safety. Part 1: General requirements.
LST EN 60529 - Degrees of protection provided by enclosures (IP code).
LST EN 61000-6-2 - Electromagnetic compatibility (EMC) -- Part 6-2: Generic standards - Immunity for industrial environments.
LST EN 61000-6-3 - Electromagnetic compatibility (EMC) -- Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments.

Should any alterations be made in the products, this declaration will no longer apply.

Quality: UAB "Salda" activities are in line with the international quality management system standard ISO 9001:2008, approved by **TÜV, THÜRINGEN.**

Date 2014-06-01

Kęstutis Kuzminskas
Technical manager

Notes

Unit's maintenance table

Product name *1 Название продукта Produktname	
gu/lu number *1 **gu/lu** номер **gu/lu** nummer	

	Interval Интервал Intervall	Date Дата Datum							
Instalation Подключение Installation									
Fan cleaning Очистка вентилятора Ventilator reinigung	**Once a year** *2 **Один раз в год** **Einmal im Jahr**								
Heat exchanger cleaning Очистка теплообменника Wärmetauscherreinigung	**Once a year** *2 **Один раз в год** **Einmal im Jahr**								
Filter replacement Замена фильтров Filter Ersatz	**Every 3-4 months** *2 **Каждые 3-4 месяцев** **Alle 3-4 Monate**								

*1
-Look at the product label.
- Смотреть на этикетку продукта.
- Sehen Sie in der Produktetikett.

*2
-- At least.
- Не менее.
- Mindestens.

NOTE. The purchaser is required to fill in the "Product maintenance table".
ПРИМЕЧАНИЕ. Покупатель обязан заполнить "Таблицу обслуживание продукта".
HINWEIS. Der Käufer ist verpflichtet, zu füllen "Wartungstabelle des Produktes".